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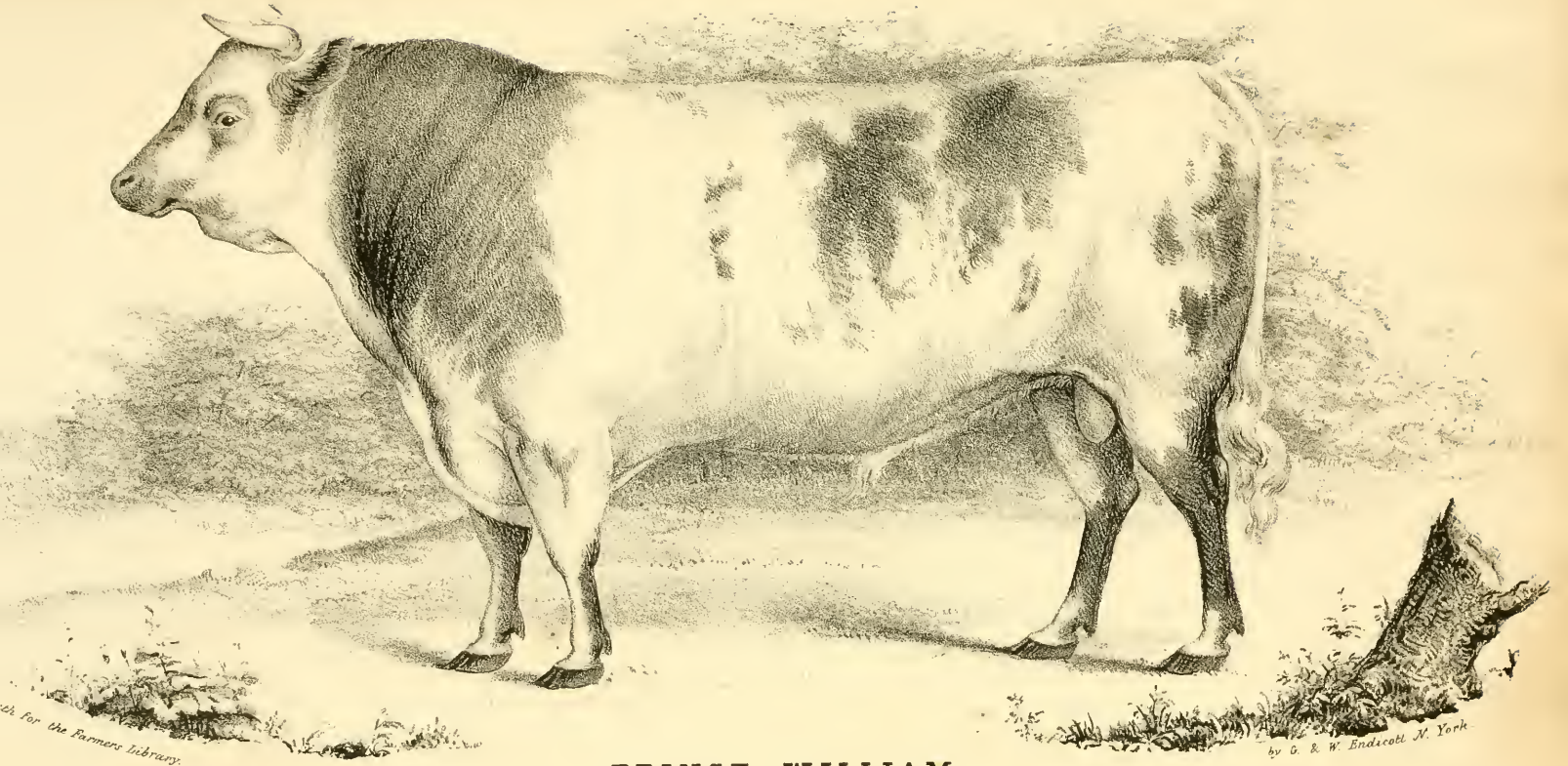
VOLUME III.



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THE

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WITH

ORIGINAL CONTRIBUTIONS FROM EMINENT FARMERS AND STATESMEN.

JOHN S. SKINNER, EDITOR.

VOLUME III.

(JULY, 1847, TO JUNE, 1848, INCLUSIVE.)

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1848.

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MONTHLY

JOURNAL OF AGRICULTURE.

VOL. III. JULY, 1847. NO. 1.

TOBACCO INSPECTION LAWS OF MARYLAND.

PROCEEDINGS OF THE PLANTERS OF PRINCE GEORGE'S COUNTY, MARYLAND.

If the commentaries on the proceedings of the planters of Prince George's county were of a local character, referring only to the interests of those who composed the meeting, we should not hold ourselves justified in taking for them the space which they occupy—this not being a State, but a national journal. The principles, however, involved in these proceedings, and the questions they present as connected with the laws of inspection, are of general import. Viewing them in that light, (without denying the particular concern we feel in all that bears on the welfare of our old friends in that quarter) we have made them the subject of some reflections which, whatever else may be thought of them, will, we hope, be deemed well timed, as we know they are well intended.

MEETING OF TOBACCO PLANTERS.

A meeting of planters of Prince George's County assembled at Upper Marlboro' on Thursday, the 8th of April, pursuant to notice, to take into consideration the present depressed condition of the tobacco market, and to offer suggestions for placing it on a better footing. A large number of the most influential planters in the county were present.

On motion of Thomas F. Bowie, Esq., Wm. R. Barker, Esq., was chosen President, Clement R. Connick, Esq., Vice President, and Geo. W. Wilson appointed Secretary.

On motion, the Chair was authorized to appoint a Committee of three to draft resolutions for the action of the meeting. Thomas F. Bowie, Benjamin M. Duckett, and Alexander Keech, Esqs., the Committee appointed, retired, and after a time reported the following Resolutions:

1. *Resolved*, That the present system of the Inspection of Tobacco in Baltimore ought to be abolished, and in lieu thereof, State Inspections in the counties where the article of tobacco is grown established.

2. *Resolved*, That the State of Maryland is under no constitutional obligation to furnish inspection and storage within its limits for tobacco grown in other States, and such legislation is, in the opinion of this meeting, prejudicial to the tobacco growers of this State.

3. *Resolved*, That the withdrawal from Baltimore of all inspection of tobacco would prevent the influx of foreign tobacco within the limits of Maryland, and thus prevent the ruinous competition which the planters of this State have hitherto encountered from that source, since the establishment of the warehouses in Baltimore.

4. *Resolved*, That a Memorial be prepared and circulated among the citizens of this and other tobacco-growing counties of the State, embracing the views set forth in the foregoing resolutions, and praying the Legislature to enact at its next Session such laws as will effectually carry out the objects embraced in these Resolutions.

5. *Resolved*, That both political parties of this and all the other tobacco-growing counties be, and they are hereby requested to unite upon the subject of these resolutions, and to offer for public favor no candidate or candidates who are not known to be favorable to the same.

The Chairman of the Committee, Thomas F. Bowie, Esq., prefaced the introduction of these Resolutions with some appropriate remarks, and strenuously advocated their adoption. [We hope Mr B. will hereafter write

out his remarks; they were listened to with great interest, and contained many valuable suggestions.]

The question was taken separately on each resolution, and they were unanimously adopted.

The Chairman, who was empowered to appoint a Committee to prepare a Memorial under the 4th Resolution, named the following gentlemen: Thomas F. Bowie, Alexander Keech, John D. Bowling, Geo. W. Marriott, W. W. W. Bowie.

Alexander Keech, Esq., submitted the following Resolutions, and prefaced their introduction by a pertinent speech:

Resolved, That so long as the present system in regard to the sales of tobacco exists, the buying and selling of the article by the same agent is inadmissible, and that the planters be recommended to dismiss said agent.

Resolved, That this meeting recommend a per centum compensation to agents instead of the fixed price per hogshead.

Thomas W. Clagett, Esq., offered the following Resolutions, and spoke in favor of their adoption; they were adopted:

Resolved, That it be recommended to the planters of Prince George's County to appoint and constitute three Special Agents from among the tobacco planters of said county, who are interested in the prosperity of the tobacco interest, to go to Baltimore and sell their produce, until the inspection of tobacco is brought back to the county.

Resolved, That it be recommended to the tobacco planters to meet in Convention at Upper Marlboro' on Saturday, the 18th April inst., to appoint the Special Agents for the purposes expressed in the above Resolution.

Geo. W. Marriott, Esq., offered the following Resolution, which was unanimously adopted.

Resolved, That the thanks of this meeting be unanimously tendered to Thomas F. Bowie, Esq., for the great exertion and labor he has undergone in behalf of the tobacco planters.

Resolved, That these proceedings be published in the Marlboro' Gazette, and that the thanks of the meeting be tendered to the Editor for his aid in behalf of the tobacco interest.

WM. R. BARKER, President.
C. R. Connick, Vice Pres't.
George W. Wilson, Secretary.

[Upper Marlboro' Gazette.

In olden time, England, France, and many other countries of Europe had laws regulating the material and manufacture of cloth, and of an infinite variety of other articles, and State inspectors were appointed to see that the various commodities brought to market were such as the law permitted the consumer of clothing and food to purchase, it being assumed almost universally that the latter were liable to be imposed upon, and that Government interference was necessary for their protection. By degrees, with advancing civilization, it began to be perceived that men were capable of self-government to a certain extent, and inspection laws fell gradually into disuse, leaving the consumers of cloth to determine for themselves whether they preferred their coats to be composed of one material, or of two; and whether a cloth of 27 or of 36 inches could most economically produce the garment desired. The disappearance of these laws from various countries was in the exact ratio of the growth of wealth, of civilization, and of the knowledge of the true laws that regulate the intercourse between man and man. At the time that they had fallen almost entirely into disuse in England, they were still in full force in France, and millions of dollars of property were destroyed in the years shortly previous to the commencement of the Revolution, to the utter ruin of its owners, because of the failure of the manufacturers to govern themselves by laws made, perhaps, a century before: possibly, even, differing but little from those of St. Louis, or of Philip Augustus, with whom the system originated. The object of those laws was to prevent frauds, yet frauds are found to exist in the precise ratio of regulation and restriction. So numerous are they in France, that it has been stated by several agents of the Government, traveling in foreign countries, that their trade is almost ruined by them, and it has been urged upon the State to establish an inspection of silks, and cloths, and paper, and of various other commodities—prohibiting the export of all such as had not been weighed and marked by Government, and certified to have been *manufactured according to law*.* Our countrymen look upon this as the hight of ab-

* The Bakers of Paris are still subjected to certain old *ordonnances*, as old as that of the Provost of Paris of 22d Nov. 1546, which says the bread "must be without mixture, well kneaded, fermented, properly shaped, well baked and dusted, cooled and dressed by half-past six in the morning. It is forbidden to use any rejected or damaged flour, or injured grain or bran, re-ground." Even the uniform of the bakers' apprentices

surdity. They are accustomed to let men use their own judgment as to whether coats shall be of woolen cloth, or of satinet, and whether they shall have long or short tails; and to determine for themselves whether they will wear shoes whose stitches are hardly "within hail of each other," and that will give way on the first wearing, or others honestly made, that will wear for months and then bear patching. They see that the general interest is best consulted by never undertaking to regulate by law what may be better adjusted by individual arrangements, and that it is easy to have *too much Government*. Nevertheless, they see nothing absurd in State inspections of tobacco, or of flour, deemed absolutely necessary to prevent frauds, as if the purchasers and sellers of commodities could find no way of coming to an understanding as to the real value of those in market, without the intervention of an officer appointed by Government, who may or may not, as it happens, possess any of the qualities necessary to constitute him a judge of the articles he is called up to inspect. *To us*, the whole system of State inspection appears an absurdity, involving no small amount of taxation, and we are happy to see that is gradually going out. The flour inspection, and we think various others, have been abolished in New-York, and we doubt not that of tobacco in Maryland will speedily follow. Nevertheless, there are some of our own readers who have such faith in the system that they believe it capable of producing the effect of diminishing the cultivation of tobacco in Ohio and Kentucky, provided the inspection be rendered local instead of general; and that the people of the West, producers of that commodity, on the one hand, and the merchants of Baltimore, purchasers of it, on the other, can thus be deprived of the intervention of an officer, appointed by Government, who, nevertheless, would be found perfectly willing to serve any private association of merchants on better terms than those upon which he now serves them at the instance of the State. In order that we may see how the local system would work, we must first inquire what is the object of inspection, and what it is that gives value to the marks the Inspector sees fit to put upon the packages that he inspects.

Tobacco differs in color and taste, and probably in other qualities. Some colors and tastes are more esteemed than others, and less abundant, and those who desire them are willing to pay higher prices for them than they would for others. In every parcel brought to market various qualities are found, and it requires nice discrimination to determine which should rank as No. 1—which No. 2, 3 or 4. The merchant wishes to purchase a number of hogsheads, but he possesses neither the leisure nor the knowledge necessary to enable him to satisfy himself as to the qualities of each, and therefore he is desirous that some one should examine it for him, and is ready to pay him for his trouble. The seller would be willing to have it *examined* by any one, but he would not permit its quality to be *marked* on the package, unless he had some control over the choice of the examiner. Both agree upon a referee, and are ready to abide by his decision; and here we have the Inspector. The qualities required in such a man are: 1. A perfect knowledge of the standard that is established and in general use, that he may put upon it such marks as will enable the purchaser in Bremen or Hamburg to know what he is buying, without a necessity for farther inspection. 2. An entire freedom from any influences that might tend to induce him

is prescribed, "they are to wear when at work a frock which is to reach below the calf of the leg, without any slit or opening, and a waistcoat closely buttoned, which may be without sleeves. They are not in any case to show themselves in the streets without pantaloons and a waistcoat with sleeves."

to act dishonestly, to the prejudice of either buyer or seller. Without these neither would agree to the reference.

At present tobacco is inspected in Baltimore, where tobacco-sellers and buyers, or their agents, congregate from all parts of the United States and of Europe. The business is very large, and, as a small compensation for the inspection of each hogshead enables the Inspector to make large wages, the office is very desirable, and is, or may be, filled by men who possess a perfect knowledge of the standard, and whose character places them beyond the suspicion of private influence; the consequence of which is that men buy and sell hundreds of hogsheads, relying upon their marks alone.

Let us now suppose the system of local inspection to be established, and see what would be the result. Every county, *and at length every election district*, has its Inspector, and twenty, fifty or a hundred different Inspectors are putting their marks on hogsheads of tobacco. The business of each is, however, small, and will not pay for the time of a man who possesses the knowledge and the honesty that are required. Such men seek larger fields of action. Inferior men now act as Inspectors, and the consequence is that the standard, ceasing to possess uniformity, becomes as various as there are various Inspectors. The Inspector, too, is a neighbor of the tobacco grower, and is unwilling to do him injury by certifying that that which the latter calls No. 1 is really only No. 2. Some have knowledge and perfect integrity; but some have only one of these qualities, and some may have neither. The buyer is in Baltimore, and he knows nothing of the parties, the consequence of which is that he attaches no value to their marks. He would as readily take the certificate of the grower himself—and even more readily, if he knew him to be a man of judgment and undoubted integrity. The result would be that the local inspection would soon cease to exist, as it did heretofore, because valueless, and the buyers and sellers in the great market would unite in appointing a referee—an Inspector—some person that they knew to possess knowledge and integrity, and whose certificate would pass current in Europe with all who desired to purchase tobacco—and thus the city inspection would be reëstablished, *without the aid or interference of Government*, a consummation, as we think, devoutly to be wished. Under such a system, the very highest degree of knowledge and integrity would be required, and would be liberally paid for, with less cost to the parties in whose service it was employed, than at present, *and that knowledge and integrity would be as much at the command of the people of Kentucky and Ohio as at that of the people of Maryland.*

We submit these views to the parties engaged in the present movement, and hope they will give them serious consideration. If they wish to put an end to the whole system of State inspection, let them obtain the law they desire, which will result in every man becoming his own inspector, *subject to the decision of a city referee;* but if they believe in any advantage to be derived from its continuance, we would advise them to hesitate about pressing the adoption of a measure that can result in nothing but disappointment. They can no more shut western tobacco out of the great market than they can make the earth revolve from east to west. One principal tobacco market there will always be. At present it is in the immediate vicinity of the planters of Maryland, who therefore have small freight to pay. If they can succeed in driving western tobacco out of that market, and thus prevent the merchant from obtaining therein all the qualities he desires to purchase, they may, perhaps, find themselves obliged to

pay the freight to Philadelphia or New-York, and thus to seek themselves the competition with the West which they now desire to restrain, or even to destroy. They should always remember that the largest market is the best to trade with.

A piece of silver of a certain size, and with a certain mark, is called a dollar, and dollars pass by tale, because every one knows that every such piece contains a given quantity of silver; but if we had a hundred different mints, public and private, engaged in stamping silver pieces, the managers of each putting in more or less alloy, according to their fancy, the result would be that every such piece would be carried to some person admitted to possess the skill to ascertain its true value, and the integrity necessary to give value to the certificate he would be requested to put upon it. That man would require to be paid, although the person who first stamped it had already been so, and thus two men would be receiving wages for doing the business that might have been done better by one. In a little time the producers of silver would find that they could obtain more for it if they went at once to the right man and obtained his certificate, and by degrees the private mints would cease to exist. Such would be the case with local inspections of tobacco.

In all poor and barbarous nations there exists an extreme jealousy of rivals in trade. It is found in all villages, and is one of the essential characteristics of what the Germans call *little-townism*. It disappears with the growth of wealth, the man who has acquired a spade feeling no jealousy of his neighbor who digs with his fingers. In evidence of this, on a large scale, we have the general extension of the warehousing system, by means of which merchants from abroad are enabled to make up cargoes in London or in New-York, composed of the productions of all the world, almost as cheaply as they could have them at the places of production. This is the system that our Maryland friends would abolish. They would go backward instead of forward in civilization, substituting jealous restriction for liberal competition. We feel assured, however, that the resolutions have been adopted without full consideration, and that the measures proposed will not be urged with a view to the accomplishment of any such object.

If the tobacco planters of Maryland would prosper they must learn that prosperity follows exertion directed by knowledge. Their competitors are men who are all laboring for themselves—men in whose minds every stroke of the ax and every furrow of the plow is identified with the personal independence and welfare of him who strikes the one and who opens the other; whereas the Maryland planter operates by the labor of those who think little and care less. He must himself do all the thinking, that he may more skillfully and effectually direct the labor of operatives who have no interest in the results, if he would successfully compete with rival planters in Ohio. If he will not give himself, mind and body, to the task—if he will live highly and spend in amusements the time and capital necessary to success—he must not be surprised if decay and poverty, manifested by exhausted lands and diminished population, be the consequence; nor will it be matter of surprise if such a state of things be accompanied by increasing jealousy of more prosperous neighbors. Hercules helps him who helps himself. Let him learn to think—to explore the real sources of his embarrassments, such as they may be—to defy such as may be averted by sagacity and exertion, and to submit with grace to such as are inevitable; but let him never play the pitiable part of a drowning man catching at a straw.

WHO IS THAT YOUNG MAN ASHAMED OF THE PLOW?

We sometimes hear of young men being too proud to be seen laboring in the fields—indeed, we are not sure that we have not seen such. Now, nothing can justify any man in eschewing manual labor on his farm, unless it be that he can be otherwise more profitably employed in the superintendence and direction of the labor of others, or that easy circumstances allow him to indulge his leisure in the luxury of acquiring knowledge by converse with men of superior minds, personally or from their writings.

Do men of narrow minds who despise labor remember that in Rome, after the expulsion of the Kings, *seven acres* were allowed to each citizen? Curius Dentatus, Fabricius, Regulus and others distinguished as the most deserving among the Romans, had no larger estates. Cincinnatus, according to some authorities, had only four acres. On these limited spaces they dwelt and cultivated them with their own hands. Until he tries it, no one knows on how little land all the essential comforts of life may be produced.

It was literally from the plow that Cincinnatus was summoned to be Dictator; and the Samnian Ambassadors, when they went to Curius Dentatus to sue for peace, found him on his farm, cooking his repast of vegetables in an earthen dish. To purchase easy terms they offered him vessels of gold, but the noble Roman disdainfully refused their offers. "I prefer," said he, "my earthen pots to your vases of gold. I have no desire for wealth, and am satisfied to live in poverty and *rule over the rich.*" Can any one, pray, tell us where any of the old Dentatus stock can be found?

Farmers of the United States!—you for whom alone we care and labor—if you can find the least sprinkle of that old blood, seize on it as you would on a scion of the choicest fruit about to become extinct, and try to breed back on it, until we can get a stock of honest men for public functionaries of every sort, whose study shall be to diffuse knowledge, to inculcate economy, and to promote peace, and such distribution of the public moneys collected from the landed interest, as shall enlighten and purify the mass of the *cultivators of the soil* until the wisdom and forecast of the constituency shall be reflected by all our public men and public bodies. If ever you can get, for instance, one of the old Washington stock, one who will tolerate freedom of thought and of speech, and go exclusively for the Constitution and the public good, persuade him to hold on until his new and salutary system of management of the public farm shall be thoroughly developed and well rooted—until an odious system called the "spoils system," worse than the Canada thistle, shall be extirpated from the whole earth, and the anxieties of all our young farmers shall be withdrawn from the tree of patronage and the fruit of office, which turneth to ashes in the mouth, and their contemplations be turned *on their own condition, business, and rights*, and to the means of their vindication and improvement.

In this exhortation there is no narrow suggestion or spirit of *party*. It is intended and believed to have a direct bearing on the prosperity of practical Agriculture; for, depend on it, as respects the ultimate welfare and safety of your pursuit, they rest, as does public virtue, itself, upon *knowledge!* How many idle young men have we, standing where idleness ever does, on the brink of ruin, and who could get ten times as much land as satisfied a Cincinnatus or Dentatus, who are yet ashamed to labor, but not ashamed to enroll their names on the list of the most abject of all slaves—slaves whose daily bread *depends on the capricious breath of arbitrary power!*

THE PATENT-OFFICE REPORT AND THE POTATO ROT.

We are well aware that no words could be selected for a caption that would be more likely than these to prompt the reader to overlook all that follows.

Of the celebrated Report from the Patent-Office of about 1,200 pages, 230 were appropriated to this subject alone; so that if the printing thereof cost $90,000, the Government paid nearly $20,000 on account of the rotten potato part of it—a sort of *omnium gatherum*, comprising not only some of the most philosophical and erudite speculations of the day, but a vast mass besides of the most absurd and puerile balderdash which until then had found its way into print in any form or through any channel. In vain may you look there, however, for any results of original and hitherto unknown investigations conclusive or plausible as to cause or cure for this vegetable malady.

How much better and more creditable would it have been to have offered liberal premiums of, say, $500 or $1,000 to practical farmers and vegetable chemists and physiologists, at home and abroad, for the best disquisitions and proofs on the subject, to be awarded by such men as Teschemacher, of Boston, and Doctor Emmons, of Albany, and Ruffin, of Virginia, to such investigators as might be found, in their judgment to disclose valuable discoveries in Vegetable Physiology, even though they might not prove to be conclusive as to the particular object of inquiry, for that may possibly remain yet for a long time impenetrable to human ken.

If that course had been taken, instead of gathering up in one great heap, at immense cost, all the chaff, as well as the grain which had been already scattered far and wide over the world, we might possibly have had something new for our money—something which for its novelty and value would have made its own way through the 100,000 impressions of agricultural and other journals, and which, like discoveries in other departments of knowledge, and by other branches of the Government, would have reflected some credit on the country, and have added something fresh and attractive to the stock of agricultural and horticultural literature—something a little more profound if not quite so pathetic as the following sample of much more such trash in the Report, distributed gratuitously to the friends of Members of Congress, but at a cost of not a great deal short, as it is said, of $100,000 to the people:

ANOTHER CAUSE FOR THE POTATO ROT PROPOSED.

To the Editor of the Maine Farmer:

Dear Sir: Please to inform your readers that, in *my* opinion, the failure of the potato crop by rot and rust is caused by *cutting the seed.* I think the whole trouble may be safely attributed to the *unfortunate use of the knife* among the seed designed for planting. I do *earnestly entreat* my agricultural friends to *pause and take into consideration this hint before they complete the destruction of that valuable root.* That *beautiful skin which God has put over the potato should not be cut, nor in any way wounded,* if a perfect crop is wanted.

The reasons, if reasons are wanted to establish *a self-evident fact,* together with the remedy, can be made the subject of another communication, if desired. B. Shaw.

Oldtown, Sept. 11, 1845.

Note.—We publish friend Shaw's remarks on the potato rot, although we cannot agree with him. If cutting potatoes caused the rot, why have we not been troubled with the disease years ago? The custom of cutting potatoes is old, while the rot is new, [*Ed. Me. Farm.*

We take it for granted that "another communication" was never "desired," and though the brevity of this earnest entreaty against "cutting" or in "any way

wounding" the "beautiful skin" which God has given the murphies, moved the tender heart of the Editor and prevailed with him to publish a theory in which he could not agree to believe, we may presume his sagacious doubts as to the soundness of the *Shaw theory* were not participated by the compiler of the Report. But perhaps not finding much that was new, plausible or important, in the files of the office, he may have considered it his duty to see how large a mass *could* be made up out of all that had been published in any shape or form. Certain it is that of the 230 pages on this single topic, very little of it made there its first appearance, and all of value that was republished might have been comprised in twenty pages.

But, after all, this huge Report will serve to give great *weight* to other Congressional precedents, which the friends of agricultural instruction will not fail to remember and to cherish. It will serve as a standing proof that Congress recognizes its *power over this subject*—that it is within its province and Constitutional sphere of action *to make appropriations out of the common treasure of the country for the diffusion of agricultural knowledge* as well as the knowledge of Astronomy, of War, and of Navigation, by the establishment of Observatories and military and naval schools and academies; and though it would be a strange organization of Government which should preclude such power in the first, and grant it in the other cases, still these Patent-Office precedents are to be hailed by the friends of the plow as so much gained. *The principle is established*, as far as they go. If Congress can appropriate $3,000 or $30,000 or $100,000 for the collection, increase, and diffusion of agricultural knowledge at all, the mere mode and form of doing it becomes a subordinate question. By whatever influence or management Congress may have been prevailed upon to exert, and the Executive to sanction the power, still there is the principle acknowledged; there stands the precedent; and now, whether it shall be used in a sneaking, left-handed manner, or whether Agriculture shall be openly encouraged as recommended by Washington and Jefferson—whether a Department shall be created for its benefit, as for interests and branches of industry and art that bear no comparison with it in productiveness or dignity, is a question to be settled between those who would place it on a footing corresponding with its contributions to national wealth and its support of all other interests on the one part, and those who, on the other, are content to have it and all that appertains to it stuck away *in a pigeon-hole of the Patent-Office!* an office highly useful in itself, and against the proper administration of which we have not now, and never have had, a word to say. Still we shall permit no search after ephemeral popularity or fear of power to drive from our memory the fact that while it presumes to take under its patronizing wing a great national interest for which Washington recommended a separate Department, this Patent-Office is itself but an appendage or bureau of one, and justly complains, we have no doubt, of having labors to perform in its proper sphere, in mass and magnitude, beyond the capacity of the force allowed by law. We do not say that it should not be, itself, an independent Department as respects the talents necessary to its administration in a manner to do honor to the country and to promote the great ends of industrial improvement. In these respects we should place it far above the Post-Office Department, which has been, very improperly and perniciously for the public interests, and very absurdly on every account, "ranged into the Cabinet." As to the actual head of the Patent Office, we take it for granted and have no doubt but he is a gentleman and a scholar. Estimating its functions very highly as we do, we

should be sorry to think otherwise; and in respect of the legislation for its government, we have deprecated and still deprecate the meanness of the allowance to the Chiefs of its scientific Bureaus, and would defy any clear-headed, honest man, having a true conception of the foundations of public welfare, to say why a man exercising for the Government such faculties as Doctor Page, for example, or Mr. Kelly, who was driven from the office—is there *any* good reason why such men should not be as highly rewarded as a full Colonel in the army? But enough of this. We do not know that we shall ever again advert to this subject, but we hold it to be not only our right but our duty to examine and criticise fearlessly whatever is done by the *Government* in direct relation to Agriculture, and to insist that a *Government performance* designed as a national exhibit of the condition, progress and desiderata of American Agriculture, when undertaken as such, shall be done in acknowledgment of and in a style commensurate in all respects with the paramount importance of the great concern it is designed to elucidate and uphold; and not be thrown in as a mere incidental make-weight to the Report of the Bureau of another Department, and made up of shreds and patches, intended to present the most valuable contents of journals which might be had for the merest trifle, and would be subscribed for by all who are worthy of having the cream of them skimmed off by the Government and presented to them for nothing. If these Reports were distributed to persons thirsting for information who were unable to subscribe for the papers from which they are made up, the case would be different.

We have not been able to get a copy of the last of these Government Annuals issued from the Patent-Office, though we believe some of our more favored brethren have been supplied. We cannot, therefore, speak with exactness as to its volume or contents, but have understood that it bears to its illustrious predecessor about the same proportion that a baby whale at the breast does to its huge mamma—for it is a fact, as the whalers of New-Bedford will confirm, that while some fashionable dames, beginning with Her Majesty Queen Victoria, put their young ones out to nurse, these monsters of the deep suckle their own brats. It does not follow, however, that because this last of the Patent-Office progeny has dwarfed to a fourth of the size of the one which went before, that it may not revert again, after a year or two, to its former character and bulkiness; for a new chapter has been opened in Natural History, by naturalists called "alternate generation," according to which, as we are told, the first progeny bears no resemblance either in form or features to the progenitor, but returns, it may be, in the third or fourth generation, to the form of the primitive parent; so that a mother may not be represented by her daughter or grand-daughter, but by her great or great-great grand-daughter, who becomes in turn the medium through which the species is perpetuated; and thus, perhaps, the Patent-Office Report of American Agriculture may return every fourth year to the standard of 1845, which, by-the-by, let it be never so well done, would, we should suppose, be quite often enough; for though individuals may be all the time making discoveries and accessions to knowledge in philosophy and the arts, such are well and properly set forth in the Patent-Office Reports of inventions, *nations* do not make visible progress *by the year*. Even elephants require some twenty months or more for procreation. What we want, in fact, is not a Government annual distillation of newspapers, but a *well-digested, comprehensive, well-executed Census*, and Normal Schools in each State for the preparation of agricultural teachers on the plan of our military schools.

We have been reminded again of the littleness of the Government—for our dealing is not with individuals—in thus extracting without paying for, the marrow of all our agricultural journals, (to be gratuitously re-distributed,) by having just read what follows, in the last, that we have seen of the *London Gardener's Chronicle*, edited by that liberal and renowned scholar Professor Lindley, one of the Commissioners appointed by the British Government to investigate the causes of the Potato Disease.

THE FARMER'S FRIEND: a Record of Recent Discoveries, Improvements, and Practical Suggestions in Agriculture. 8vo. Smith, Elder, and Co., 65 Cornhill, London.

It *ought* to be a good book, for it is just the *cream* of the Editor's agricultural library. Professedly so: he has simply *skimmed the various numbers and journals of the farmer's periodical literature, and transferred the produce to his own pages.* And there is no doubt that it *is* a good book. Containing as it does the best of everything communicated to our own columns and those of other agricultural periodicals, it could not be otherwise. The only question for consideration is, whether or not the public will patronize a scheme involving *so entire an entering into other people's labors as this. We do not think it ought.* No doubt a compilation is none the worse for its being a professed compilation; but *the idea of publishing every six months a selection from the pages of the best new books on farm matters, is so much more distinguished by its boldness than by its justice, that certainly we shall not speak a good word for it* Nevertheless we have no objection to let the editor say one for himself. The following is an extract from the Preface:

"To the editors of the several journals who have so kindly and liberally permitted the Editor of this book to avail himself of their respective publications, he begs to offer his cordial and grateful acknowledgments. He hopes that the value of the extracts which he has made, may induce many to have recourse to the original sources for the information which, in this work, they can, for the most part, only have in a fragmentary form; and that thus, at least, he may have helped to advance the great cause of agricultural improvement; a cause the promotion of which is daily becoming a subject more momentous and vital.

What miserable cant is this! When you have seized and cracked another man's nuts and distributed the kernel gratuitously to the public, you would persuade him that the taste of these would induce people to go more eagerly to buy up the hulls! How considerate this in Uncle Sam! How polite! Well, there is a virtue, called the *suaviter en modo*, which, it cannot be denied, has its charm, as exhibited in the courtesies even of the robber on the Mexican highway, when, with a pistol at your head, he most gracefully begs to have the honor of becoming your banker.

There is this, however, to be said in behalf of the compiler complained of by Professor Lindley, who, to make up his book, "skimmed the various numbers and journals of the farmer's literature and transferred the produce to his own pages." *He* paid at least the cost of paper and printing, out of his own pocket, whereas when Uncle Sam turns agricultural editor he makes up his manual out of the cream of other people's labor; paying for the *publication* of it out of the general public treasure, and then bestows it gratuitously not on men unable to buy, but on partisan favorites of Members of Congress. All the agricultural editors of the Union—except ourselves—are but so many caterers, whose materials, gathered up at their own cost, are seized upon by the Government, lying in wait for them, as they come in from the fields where they have been collected, with much pains, and in the plentitude of its power condemns them as lawful prizes. Were an individual to commit such piracy, the law would make him amenable. Even the jackall, commonly called the *lion's provider*, is only required by the king of beasts to *start* the game for his master; but our king of editors, the U. S. Government, requires his purveyors to run it down and to bring it in to be laid at his royal majesty's feet.

That The Farmers' Library has been spared from much mutilation would perhaps be mortifying to our vanity, did that not lead us to ascribe the omission to that

amiable repugnance to cutting into the body of such a beautiful creature as it is —to that same tenderness of feeling which prompted Mr. Shaw to protest against cutting with a "knife" the beautiful skin which God had given to the potato; and should none of our correspondents and essayists be quoted hereafter, we would persuade them to take comfort in the recollection that the absence of Brutus's statue from the procession was observed with particular sensation, and considered a higher compliment to the Roman patriot than if it had been paraded in its place with all the others.

Returning to the Disease in the Potato. In 1844, Mr. Teschemacher of Boston, announced, and was we believe the first to announce the opinion founded on observation, that the cause of the rot was a *fungus*; the spores or seeds of which exist in vast quantities in the atmosphere. In 1845, the French Academy of Arts and Sciences, acting on the enlightened and exemplary principle that in the prosecution of scientific researches, and the distribution of honorary rewards for great discoveries, there should be no geographical limits, deputed Professor Charles Morren of Liege to examine into the cause of the potato rot, and he came to the same conclusion which had been reached and proclaimed in the New-England Farmer the year before by Mr. T. It has been acted upon successfully, as we have understood, in the neighborhood of Boston. But after all, we apprehend that no theory has been so well established as to be pronounced "self-evident." On the contrary, as Doctor Doubty would say, "much may be said on both sides;" but we incline to the opinion that in Mr. Colt's case, the conservative virtue was in the *salt*—while the other ingredients may have acted as fertilizers, to increase the crop, restoring to the land some of constituents necessary to the production of that plant, and which had been carried off from it by previous crops.

My Dear Sir: You have asked me for my opinion about the *potato rot*. I must confess that I am as much at a loss to say the why and the wherefore of this disease, as those who have sought for its causes in Europe. This I can say, however—potatoes manured with *barn-yard manure* are infinitely more subject to the rot than those raised without it. I have found the best yield, where I spread broadcast eight or ten bushels of *Turks Island* salt per acre, that cost me twenty-three cents the bushel, and then treated with a compost—three parts marsh mud—one part anthracite ashes—one part slaked lime, and one part plaster of Paris. In that case I had no rot, the crop was not large—about 100 bushels to the acre, but they were of excellent quality. These potatoes, say "Mercers" and "pink-eyes," when dug, were put in barrels, filled with cinders or charcoal-dust from the railroad, and these potatoes which I am now using, are as dry and mealy as those dug in November or December—no rot, or a sign of rot among them.

I am convinced that if one will manure his potato lands not with horse manure, but with salt, ashes, and lime, he will escape this murrain in his potato crop. I am no chemist, but this I know, that salt, lime and ashes gave me as fine potatoes as any one need to wish for.

It is a curious fact as to potatoes, that in 1845 we had no potato balls or seeds. I inquired for them and sought for them in various parts of the State—found none and had none myself, and could procure none elsewhere. In 1846 we had some balls. I have collected a parcel, which this spring I have sowed, and will see what the result will be, and test the value of raising new varieties from seeds, in which I place confidence. At all events, I deem it a duty in every one who has the means, to test all such experiments as may be beneficial to the community; tell me, therefore, what I shall try, and I will try it for the good of my neighbors. Yours truly, R. L. C.

Well Said.—A wealthy farmer in Kentucky says, "I would rather be taxed for the education of the boy, than the ignorance of the man—for one or the other I am compelled to be."
[Border Watch.

VARIETIES OF POTATOES FROM THE SEED.

To Raise Varieties.—A variety of the potato is generally considered to continue about fourteen years in perfection, after which period it gradually loses its good qualities, becoming of inferior flavor and unproductive; fresh varieties must, therefore, be occasionally raised from seed. The berries, or apples, of the old stock, having hung in a warm room throughout the winter, the seed must be obtained from them by washing away the pulp during February. This is thoroughly dried and kept until April, and then sown in drills about half an inch deep and six inches apart, in a rich, light soil. The plants are weeded, and earth drawn up to their stems, when an inch in hight; as soon as this has increased to three inches they are moved into a similar soil, in rows sixteen inches apart each way, and during their future growth earthed up two or three times. Being finally taken up, in the course of October, they must be preserved until the following spring, to be then re-planted and treated as for store crops.

Some gardeners sow in a moderate hot-bed, very thin, in drills the same depth as above, and nine inches apart. Water is frequently and plentifully poured between the rows, and earth drawn about the stems of the seedlings until they are a few inches in hight. They are then transplanted into rows, water given, and earthing performed as usual. The only additional advantage of this plan is, that as the seed can be sown earlier, the tubers attain a rather larger size the first year.

It is to be remarked that the tubers of every seedling should be kept separate, as scarcely two will be of a similar habit and quality, while many will be comparatively worthless, and but few of particular excellence. If the seed is obtained from a red potato that flowered in the neighborhood of a white-tubered variety, the seedlings, in all probability, will in part resemble both their parents; but seldom or never does a seedling resemble exactly the original stock. At all events, only such should be preserved as are recommended by their superior earliness, size, flavor, or fertility.

The early varieties—if planted on little heaps of earth, with a stake in the middle, and when the plants are about four inches high being secured to the stakes with shreds and nails, and the earth washed away from the bases of the stems by means of a strong current of water, so that the fibrous roots only enter the soil—will blossom and perfect seed.

Forcing.—The season for forcing is from the close of December to the middle of February, in a hot bed, and at the close of this last month on a warm border, with the temporary shelter of a frame. The hot-bed is only required to produce a moderate heat. The earth should be six inches deep, and the sets planted in rows six or eight apart, as the tubers are not required to be large. The temperature ought never to sink below 65°, nor rise above 80°.

The rank steam arising from fermenting dung is undoubtedly injurious to the roots of potatoes; and to obviate this they may be planted in narrow beds, and the dung applied in trenches on each side; or all the earth from an old cucumber or other hot-bed being removed, and an inch in depth of fresh being added, put on the sets, and cover them with four inches of mould. At the end of five days the sides of the old dung may be cut away in an inward slanting direction, about fifteen inches from the perpendicular, and strong linings of hot dung applied.

If the tubers are desired to be brought to maturity as speedily as possible, instead of being planted in the earth of the bed, each set should be placed in a pot about six inches in diameter; but the produce in pots is smaller. But young potatoes may be obtained in the winter, according to the following plan, without forcing:

Plant some late kinds, unsprouted, in a dry rich border, in July, and again in August, in rows two feet apart. They will produce new potatoes in October, and in succession until April, if covered with leaves or straw to exclude frost. If old potatoes are placed in dry earth, in a shed, during August, they will emit young tubers in December.

Preparation of Sets for Forcing.—They should be of the early varieties. To assist their forward vegetation, plant a single potato in each of the pots intended for forcing, during January. Then place in ground, and protect with litter from the frost. This renders them very excitable by heat; and, consequently, when plunged in a hot-bed, they vegetate rapidly, and generate tubers. The seed potatoes are equally assisted, and with less trouble, if placed in a cellar just in contact with each other, and as soon as the germs are four inches long, are removed to the the hot-bed.

Management.—More than one stem should never be allowed, otherwise the tubers are small, and not more numerous.

Water must be given whenever the soil appears dry, and in quantity proportionate to the temperature of the air. Linings must be applied as the temperature declines; and air admitted as freely as the temperature of the atmosphere will allow. Coverings must be afforded with the same regard to temperature.

From six to seven weeks usually elapse between the time of planting and the fitness of the tubers for use. The average produce from a light soil is about five pounds.

There is another mode of obtaining young potatoes, during the winter, which is much practiced on account of its facility; though, being produced without foliage, they are not so fine in flavor, are deficient in farina, and are otherwise inferior. Old potatoes often throw out from their sides young ones, early in the spring; and of this habit advantage is taken in obtaining them still earlier. Some full-grown and ripe tubers, of the ox noble variety, that have no appearance of vegetating, must be laid alternately with layers of perfectly dry, rich vegetable mould, four inches deep, in pans or boxes, until they are filled. These may be placed in a thoroughly dry shed, or on a shelf in the kitchen. If the layers are constructed in the corner of a shed or cellar, the produce will be equally good, though longer in coming to perfection. No foliage is produced, the potatoes soon are surrounded by numerous young ones of moderate size. No water must ever be admitted on any account. Notice is to be taken that between three and four months elapse between the time of forming the layers and the fitness of the produce for use. Thus if made early in September, the crop will be ready in the course of December. When they are examined, those that are fit may be taken off, and the old potatoes replaced until the remainder are ready.

[Johnson's Gardener's Dictionary.

LIEBIG'S MANURES.

If the name and the subject which these two words present would not provoke the curiosity of the reader to peruse what follows, and judge for himself, it is not to be expected that anything we could say would induce him to do so.

We are aware that the topic is a dry one, but that, after all, depends very much, with all questions, on the spirit with which they are encountered.

If men read for the sake of enlarging the bounds of their knowledge, there is no disquisition that can prove dry to him who feels, as he proceeds, that delightful enjoyment of the mind which the conscious accretion of knowledge brings along with it. If those who favor The Farmers' Library with their patronage take pleasure only in reading accounts of wonderful crops and descriptions of large, fat sheep and bullocks, and simply of how poor land may be made rich, by plowing in ashes, and lime, and manure—things well known since long before the days of Varro and Columella—we fear they will be disappointed; and if their reading be only to have their sympathies excited and their passions moved, why, the better way would be to give orders to their bookseller to supply them with the latest novels as they come every day reeking from the press. But we flatter ourselves that our patrons are for the most part persons who are seeking to get at the philosophy of their business, that they may follow and enjoy it as one that invites exercise and industry of the mind as well as of the body.

If that be not the object, what is the use of taking such a work as we are endeavoring to make of this? If facts only are what they seek, any one of our old volumes of the American Farmer, as far back as 1819, will tell nearly the whole story.

It may have appeared in some other shape or work, but the only one in which we have seen what follows from the pen of one of the most distinguished inquirers into the science of Agriculture, is the pamphlet which is here copied, and which was kindly placed in our hands by an English professional gentleman who has embraced the science and literature of Agriculture within the range of his extensive inquiries. The perusal will require and reward the reader's close attention, and be pronounced an appropriate and valuable addition to every farmer's library.

Professor Liebig proceeds next, among other things, to show and expose the fallacy of the belief entertained by some, that in applying bone manure, plaster of Paris (gypsum) nitrate of soda, &c., they may dispense with manure and with other elements of the soil.

PREFACE, BY THE MANUFACTURERS OF PROF. LIEBIG'S MANURES.

Through accurate knowledge of what elements of the soil serve to nourish our cultivated plants, and are thus removed with the crops, minute examinations of those properties which give to the different kinds of stable manure their fertilizing effects, and careful investigation of the causes why the substitution of guano and other artificial manures has in some cases produced highly beneficial results, while in others it has proved utterly inefficacious—why successful only in some seasons, and upon some descriptions of soil—the eminent chemist whose name is attached to the succeeding Address has discovered certain compounds which can not only be employed with advantage in place of the best stable dung, but which, possessing none of the defects of guano, are of such a nature that different states of moisture in the atmosphere during the growth of the plants, or different localities, will not diminish their efficacy.

It is a well-known fact in vegetable physiology that all plants do not extract from the soil the same solid and volatile mineral elements: the elements removed in a crop of wheat are different from those taken in a crop of turnips or potatoes, &c. &c.; it is obvious, therefore, that to give to the soil a compound without discrimination as to the crop to be grown is a waste of material, and the invention of the Professor, which is protected by patent, is consequently applied to the fabrication of manures suited to every kind of crop.

Though the fertility of our fields depends mainly on the mineral ingredients of the soil, it must not be assumed that their state or condition is without influence; and it is not pretended that in using these manures the mechanical operations which are known to increase the capability of production are to be dispensed with; on the contrary, where those operations are carried on according to the best and most improved principles, the efficacy of the manures will be the greatest, their office being to replace what has been removed and what is indispensable toward securing a crop. And, although the inventor has given such elements to the compounds as to render them agreeable to all descriptions of soil, it would not be without utility toward particular adaptation, that the manufacturers were informed of the general qualities of the soil for which they are required: whether arenaceous or calcareous, clayey or loamy, light or stiff.

As regards the cost attending the use of these manures, a slight consideration of the subject will show that manuring with them will be cheaper than manuring in the ordinary way. For instance, take the wheat manure; the price is ten pounds a ton; but five cwt. only are required for an acre, and as every particle is adapted to and acts favorably on the crops, the farmer pays only for what is useful to him, whereas hitherto he has furnished his lands with the unnecessary and useless along with the necessary and useful, paying for both at the same rate. Farther, it is the object of these manures to render the change of crops and fallowing unnecessary and superfluous: WITH THEIR USE ONE AND THE SAME KIND OF CROP MAY BE GROWN YEAR AFTER YEAR UPON THE SAME FIELD.

It has already been observed that the composition of the "Patent Manures" is such as to counteract the doubtful qualities of guano. It is therefore proposed to those farmers who use stable dung or guano, to apply at the same time the "Patent Manures" as a top-dressing, although not in the same quantity as if no other manure had been used. The farmer will, of course, be best able to arrange this according to his other expenses.

In using the "Patent Manures," lime and gypsum, &c., for grass-lands, both sown and meadow, and for clover, can be entirely dispensed with.

The "Patent Manures" may be applied either broadcast or in drills. If the manure is strewed over the surface, every small shower will dissolve some of its elements; the water thus saturated will filter through the soil, and bring them into contact with the absorbing ends—the roots. At all events, it may be regarded as a rule that the "Patent Manures" are to be placed near the surface, and at a little distance from the seed.

The manufacturers having placed the fabrication under the superintendence of a highly respectable chemist—chosen by Professor Liebig—can assure the public that no manure will leave their premises without containing its full quantity of fertilizing matter, in exact accordance with the principles of the inventor.

Manure of each kind will be ready for the sowing seasons, and as the time for wheat is approaching, we respectfully request those parties who purpose using No. 1, to inform us of the quantity they will require as early as possible.

In conclusion, we may suggest that, as the solution of the problem of artificial manures is one from which the greatest benefit must arise to the community at large, all results of our manures should be communicated to us, or be made as public as possible.

The manures are classed as follows: No. 1. Manure for wheat, rye, barley, oats. 2. Potatoes, turnips, mangel-wurzel, beet-root, parsnips, and all bulbous roots. 3. Grass. 4. Clover, lucern, peas, beans. 5. Tobacco. 6. Flax.

The price per ton is £10 net cash, for wheat manure in Liverpool. MUSPRATT & CO.

THE PRINCIPLES OF ARTIFICIAL MANURING.

BY PROFESSOR JUSTUS LIEBIG.

If we compare the experience of farmers regarding the fertility of the soil and the quantity of its productions, we are surprised by a result which surpasses all others in general application and uniformity.

It has been observed, that in every part of the globe where Agriculture is carried on, in all varieties of soil, and with the most different plants and modes of cultivation, the produce of a field on which the same or different plants have been cultivated during a certain number of years, decreases more or less in quantity, and that it again obtains its fertility by a supply of excrements of man and animals, which generally are called manure; that the produce of the fields can be increased by the same matters, and that the quantity of the crop is in direct proportion to the quantity of the manure.

In former times scarcely any attempt was made to account for the cause of this curious property of the excrements of man and animals. Without taking into consideration the origin of the excrements and the relation they bear to the food, it is not astonishing that their effect was ascribed to a remnant of vital power which should qualify them to increase the vitality in plants. Ascribing their influence on the fertility of the fields to an incomprehensible occult cause, it was forgotten that every force has its material substratum; that with a lever, in a mathematical sense,

which possesses no extension and gravity, no effect can be produced, no burden raised.

Guided by experience, which is the fundamental basis of all inductive science, and which teaches us that for every effect there is a cause, that every quality, as, for instance, the fertility of a field, the nourishing quality of a vegetable, or the effect of a manure, is intimately connected with and occasioned by something which can be ascertained by weight and measure; modern science has succeeded in enlightening us on the cause of the fertility of the fields and on the effects which are exercised on them by manure.

Chemistry has shown that these properties are produced by the composition of the fields; that their fitness for producing wheat or any other kind of plant bears a direct proportion to certain elements contained in the soil, which are absorbed by the plants. It has likewise shown that two fields, of unequal fertility, contain unequal quantities of these elements; or that a fertile soil contains them in a different form or state from another, which is less fertile. If the elements are contained in the soil in sufficient quantities, it produces a rich crop; if it be defective even in one of them only, this is shown very soon, by the impossibility of growing on it certain kinds of plants.

Moreover, it has proved with certainty what relations these elements of the soil bear to the development of the plants. Chemical analysis has demonstrated that a certain class of these elements is contained in the seeds; others, in different proportions, in the leaves, roots, tubers, stalks. They are mineral substances, and as such, are indestructible by fire, and consequently remain as ashes after the incineration of the plants or of their parts. Many of these elements are soluble in pure water, others only in water containing carbonic acid, as rain-water; all were absorbed from the soil by the roots of the plants in a dissolved condition. It has been shown that, in a field, those elements which remain after the incineration of the grain or seeds, are not present in a sufficient quantity, no wheat, no barley, no peas—in a word, none of those plants can be cultivated on that field which are grown on account of their seeds. The plants which grow on such a field produce stalks and leaves; they blossom, but do not bear fruit. The same has been observed regarding the development of leaves, roots and tubers, and the mineral elements which they leave behind after their incineration. If, in a soil in which turnips or potatoes are to be cultivated, the elements of the ashes of these roots are wanting, the plants bring forth leaves, stalks, blossoms and seeds, but the roots and tubercles are imperfect. Every one of the elements which the soil gives up to the plants is in a direct quantitative proportion to the production of the separate elements of the plants. Two fields, which, under otherwise equal circumstances, are unequally rich in mineral elements of the grain, produce unequal crops. One containing them in larger quantity produces more than another containing them in less. In the same manner, the capacity of a soil to produce tuberculous plants, or such as have many leaves, depends upon its amount of those elements which are found in the ashes of such plants.

It results from this with certainty, that the mineral substances which are furnished by the soil, and which are found again in the ashes of plants, are their true food; that they are the conditions of vegetable life.

It is evident, that from a field in which different plants are cultivated, we remove with the crop a certain quantity of these elements; in the seeds those mineral parts which the soil had to provide for *their* development, and in the roots, tubercles, stalks and leaves those elements which are necessary for *their* production. However rich the field may be in these elements, there can be no doubt that, by several cultures, it becomes more and more impoverished; that for every plant a time must arrive when the soil will cease to furnish, in sufficient quantity, those elements which are necessary for a perfect growth. Even if such a field, during many years, had produced twenty-five or thirty fold the amount of the seed, for instance, of wheat, experience shows that the crop gradually decreases, until at last the amount will be so small as to approach the plant in its wild state, and not repay the cost of cultivation.

According to the unequal quantity in which the mineral elements of grain, tubercles, roots, seeds, leaves, are contained in a soil, or according to the proportions in which they have been removed in the crop, the land may have ceased to be fertile for roots and tubercles, but it may yet produce good crops of wheat. Another may not produce wheat, but potatoes and turnips may thrive well in it. The mineral substances contained in a fertile soil, and serving as food to the plants, are taken up by them with the water, in which they are soluble. In a fertile field they are contained in a state which allows of their being absorbed by the plant and taken up by the roots. There are fields which are rich in these elements, without being fertile in an equal proportion; in the latter case they are united with other elements into chemical compounds, which counteract the dissolving power of water. By the contemporaneous action of water and air—of the oxygen and carbonic acid of the atmosphere—these compounds are decomposed, and those of their constituent elements, which are soluble in water, but which had been insoluble by the chemical affinity of other other mineral substances, reobtain the property of being absorbed by the roots of the plants.

The duration of the fertility of a field depends on the amount of the mineral aliments of plants contained in it, and its productive power for a given time is in a direct proportion to that part of its composition which possesses the capacity of being taken up by the

plant. A number of the most important agricultural operations, especially the mechanical, exercise an influence on the fertility of the fields only thus far, that they remove the impediments which are opposed to the assimilation of the mineral food into the vegetable organism. By plowing, for instance, the surface of the field is made accessible to air and moisture. The nutritious elements contained in the soil in a latent state, acquire, by these operations, the properties necessary for their transmission into the plants. It is easy to conceive the useful influence which, in this respect, is exercised on the produce of the fields by the care and industry of the farmer. But all these labors and efforts do not increase the amount of mineral elements in the field: in rendering soluble in a given time a larger quantity of the insoluble substances, and obtaining by these means a richer crop—the time is merely hastened in which the soil becomes exhausted.

The experience of centuries has shown that, with the aid of manure, of the excrements of animals and man, with which we supply those fields which have ceased to produce crops of grain, &c., serving as food for man and animals, in a sufficient quantity, the original fertility can again be restored; an exhausted field, which scarcely yielded back the seed, is made to produce a twenty and more fold crop, according to the proportion of the manure provided.

Regarding the mode of action of manures, it has been observed that all excrements do not exercise an equal influence on plants. The excrements of sheep and cattle, for instance, increase in most fields the crop of roots and herbaceous plants to a far greater degree than those of man and birds, (guano.) The latter act far more favorably on the production of grain crops, especially if they are added to the animal excrements, and are given to the fields at the same time.

A field, for example, which has lost its fertility for potatoes and turnips, but on which peas and beans still thrive, becomes far more fertile, by a supply of the excrements of horses and cows, for a new crop of potatoes and turnips, than by manuring it with the excrements of man or with guano.

The most accurate experiments and analyses have pointed out that the excrements of man and animals contain those substances to the presence of which the fertility of the soil is due. The fertilizing power of manure can be determined by weight, as its effect is in a direct ratio to its amount in the mineral elements of the food of plants. The truth of the result of these chemical analyses must be evident to every one who inquires into the origin of excrements.

All the excrements of man and animals are derived from the plants of our fields; in the oats and hay which serve as food for the horse, in the roots which are consumed by a cow, there is a certain quantity of mineral ingredients. A horse, in consuming 15 lbs. of hay and 4½ lbs. of oats per day, consumes 21 ounces of those substances which the hay and the oats took from the fields; he consumes annually 480 lbs. of these constituent elements of the soil, but only a very small portion of them remains in his body. If a horse, during one year, increases 100 lbs. in weight, this increase contains only 7 lbs. of those mineral substances which were contained in the food. But what has become of the 473 lbs. which we cannot detect in his body?

The analysis of the fluid and solid excrements which the horse gives out daily, shows that the ingredients of the soil which do not remain in the body of the animal are contained in its excrements; it shows that in an adult animal, which from day to day neither increases nor decreases in weight, the amount of the mineral ingredients of the excrements is equal in weight to the mineral ingredients of the food.

As with the horse, so it is with all animals. *In all adult animals the excrements contain the ingredients of the soil according to the quantities and relative proportions in which they are contained in their food.*

The mineral substances of the food which have remained in the body of the animals, and served to increase their weight, are found again in the bones and excrements of man, who consumes the flesh of these animals.

The excrements of man contain the elements of the soil, of bread or of grain, of vegetables and meat.

These discoveries explain, in a most simple and satisfactory manner, the fertilizing effect which manure produces on our fields.

It is now obvious why manure renders again fertile the exhausted fields; why, by its means, their productiveness can be augmented; why the latter is in a direct ratio to the quantity of manure administered.

The exhaustion of the soil by subsequent crops, its decrease in fertility, is produced by the gradual removal of the mineral elements, in a soluble state, which are necessary for the development of our cultivated plants. By a supply of manure they are again restored to the state suited to serve as nourishment to a new vegetation.

If the supply of the removed elements of the soil, by means of manure, be sufficient, if the quantity taken away be restored, the original fertility reäppears; if the supply be greater, the produce increases; a defective supply gives a smaller produce.

It is now explained why the different kinds of manure exercise an unequal effect upon the fields.

The excrements of man and guano, containing especially the mineral ingredients of grain and of meat, exercise far greater influence on the amount of produce of grain in a field in which these ingredients are wanting, even if those of the leaves and stalks are present in sufficient quantity, than the excrements of an animal which feeds on roots or green fodder.

The excrements of the latter contain the mineral elements of the leaves, stalks, and roots in prevailing quantity, and have a greater value for the production of roots and foliaceous plants than those of man or of birds, which contain only a small quantity of those mineral substances which they require for their development.

If we compare, for instance, the composition of guano with the excrements of the cow—solid and fluid excrements in the same state of dryness—it is found, that in an equal weight, the latter contain five to seven times more of the mineral ingredients of turnips and potatoes than the former. If, in a soil which is deprived of all those mineral substances, we wish to force a crop of turnips by means of guano, we require at least five times more of guano than dung of cattle.

The same thing happens, though *vice versa*, if we wish to produce a rich crop of grain by means of animal excrements; in this case, one part of guano and five parts of animal excrements, produce the same effect as thirteen to fifteen parts of animal excrements.

To understand the proper meaning of these numerical proportions, it is sufficient to mention that 400 lbs. of bones contain as much phosphoric acid as 1,000 lbs. of wheat; these 400 lbs. of bones can furnish sufficient phosphoric acid to eight acres.

If we take the importation of bones into Great Britain in the last ten years to amount to 1,000,000 of tons, enough phosphoric acid has been supplied to the fields for 25,000,000 tons of wheat; but only a small proportion of the phosphoric acid of the bones is in a state to be assimilated by the plants and applied to the formation of grain. The plants, in order to apply the other far greater part of the phosphoric acid to their formation, must find a certain quantity of alkaline bases beside the bone-earth, which are not given to the plants in the bones, because they contain neither potash nor soda.

To have increased the fertility of the fields in the right proportion, 800,000 tons of potash ought to have been added to the 1,000,000 tons of bones, in a suitable form.

The same is the case with guano: 60 to 100 lbs. of it are sufficient to furnish phosphoric acid to one acre of turnips; but the four to eightfold quantity is required to furnish the turnips with the necessary alkaline bases, and it is still doubtful whether they can be at all provided with the latter, by means of the salts with the alkaline bases, which the guano contains.

At a time when the necessity of the mineral substances for the growth and development of plants, and the direct relation which the effect of manure has to its amount of the same substances, had not been ascertained, a prominent value was ascribed to the organic matters which it contains. For a long time it was thought that the produce of a field of those substances containing nitrogen, which serve as food for man and animals, stood in a direct proportion to the nitrogen contained in manure. It was believed that its commercial value, or its value as manure, might be expressed in per cents. by its proportion of nitrogen, but later and more convincing observations have induced me to contradict this opinion.

If the nitrogen and carbonic acid formed by the decay and decomposition of the vegetable ingredients of manure were the cause of its fertilizing power, this ought also to be seen if the mineral substances were excluded. Direct experiments have shown that the nitrogen of the excrements can be assimilated by the plants in the form of ammonia, but that ammonia, as well as carbonic acid, although it is indispensable for the development of all plants, can accelerate the growth of plants and increase the produce of a field of grain, roots and tubercles *only*, if, at the same time, the mineral ingredients contained in the manure which is applied, are in a state in which they are suited for assimilation. If the latter are excluded, carbonic acid and ammonia have no effect on vegetation.

On the other hand, experience has shown that on many fields produce which is rich in carbon and ammonia, can be increased to an extraordinary amount, without any supply of such matters as furnish these substances.

On fields which are provided with a certain quantity of marl or slaked lime, or with bone-earth and gypsum—substances which cannot give up to the plants either carbon or nitrogen—rich crops of grain, tubers and roots are obtained in many places, entirely in contradiction with the view which ascribes the effect of the manure to its amount of ingredients containing nitrogen or carbonic acid.

To explain this process, which is so opposite to the common opinion, the marl, the lime, the gypsum, the alkalies and the bone-earth were regarded as stimulants, which acted on the plants like spices on the food of man, of which it was believed that they increased the power of assimilation, and allowed the individuals to consume larger quantities of food.

This view is contradicted, if we consider that stimulants mean such substances as do not serve for the nourishment of the organism or for the formation of organic elements, and can only increase the weight of the body, if at the same time a certain increase of food is given. In supplying the fields with the above mentioned substances, the weight of the plants became increased in all their separate parts, without their having been provided with the quantity of food which according to theory, was necessary to this extraordinary increase—viz., with carbonic acid and ammonia.

Chemical analysis shows that these so-called stimulants are either actual ingredients of manure, as gypsum, bone-earth and the active substances of the marl, or that they are the means by which the mineral elements contained in the soil are resolved into a state

adapted for being assimilated by the plants; this is generally effected by the application of slaked lime. They consequently exercise on the vital process of the plants not a mere stimulus like the spices, but are consumed for the development of the leaves, seeds, roots, &c., they become constituent parts of them, as can be shown with certainty by chemical analysis.

The success which has followed the application of these substances to the fields has explained, in a most striking manner, the origin of the carbon and nitrogen in the plants.

In the marl, in the bone-earth, in the gypsum, in the nitrate of soda, no carbon is provided to the fields; and yet, in many cases, the same produce, in some even a higher one, is obtained, than by the application of a manure containing carbon and nitrogen. As the soil, after the crop, does not contain less carbonaceous or nitrogenous substances, it is evident that these products, which had been obtained without any carbonic or azotic manures, must have got the carbon and nitrogen of their leaves, roots and stalks from the atmosphere; it follows, therefore, that the productiveness of the fields cannot be increased in proportion with a supply of carbonaceous and azotic substances, but that the fertility depends only on the supply of those ingredients which should be provided by the soil.

The soil not only serves the purpose of fixing the plants and their roots; it participates in vegetable life through the absorption of certain of its elements. If these elements are present in sufficient quantity, and in appropriate proportions, the soil contains the conditions which render the plant capable of absorbing carbonic acid and ammonia from the air, which is an inexhaustible storehouse for them, and renders their elements capable of being assimilated by their organism.

The agriculturist must, therefore, confine himself to giving to the field the composition necessary to the development of the plants which he intends to grow; it must be his principal task to supply and restore *all* the elements required in the soil, and not only one, as is so frequently done; the ingredients of the air, carbonic acid and ammonia, the plants can, in most cases, procure without man's interference; he must take care to give to his field that physical condition which renders possible and increases the assimilation of these ingredients by the plant; he must remove the impediments which diminish their effect.

The favorable influence which bone-earth, gypsum, nitrate of soda, exercise on the fields has induced many farmers to the belief, that in applying them they can dispense with manure or with the other elements of the soil; it requires, however, only little attention to see the great error of this opinion. We observe that the effect of these substances is not equal on all fields; in one place the amount of produce is increased by the lime, by the bone-earth, and by gypsum; in another country, or on other fields, these substances in no way favor vegetation. From this arise the contradictory views of farmers regarding these matters as manures. If one farmer thinks the liming of his fields quite indispensable for rendering them fertile—another declares that lime produces no effect at all.

The reason of this difference is very simple. The examination of a soil upon which lime has had no effect, shows that it was already rich in this substance: it farther shows that its effect extends only to those kinds of soil in which lime is wanting, or in which it is found in too small a quantity, or in a condition which is not suited to its assimilation by the plant. Lime especially serves for resolving the silicates of alumina (clay) and consequently it cannot fertilize soils in which clay is wanting, for instance, sandy soils. It must be apparent to every one, that on the calcareous and gypseous fields of France and England one-half per cent. of gypsum or lime can have no influence at all on vegetation. This can be said with equal justice of bone ashes, and of every other mineral substance serving for the nourishment of plants.

If these substances exercise a favorable effect, some of the constituents of the soil or manure are restored, which are indispensable to the nourishment of plants, and which have been wanting in the soil. If this be the case the other bodies, equally necessary, must be present in sufficient quantity. On a field in which sulphate of lime has acted favorably, but in which clover had been cultivated without it, the crop was 2,200 pounds of clover-hay, in which 53 pounds of potash were removed. On the same field, after it had been dressed with gypsum, 8,000 pounds of hay were produced, which contained 191 pounds of potash. If this potash had not been present in the soil, the gypsum would have had no effect—the crop would not have been increased. On fields which are richly provided with all other mineral ingredients, with the exception of gypsum, the latter is applied with the greatest success. But if gypsum is present in the soil, the same effects are produced by ashes and lime, as is the case in Flanders. On fields in which phosphate of lime is wanting, bone ashes increase the produce of grain, clover, or grass, and on argillaceous soil, lime produces a decided improvement. All these substances act only on those fields which are defective in them, and if the other elements of the soil are present. The latter cause the former to come into action, and *vice versa*. The farmers who thought that by using lime, gypsum, bone-earth, &c., they might dispense with animal manure, very soon observed that their fields deteriorated. They observed that after a third or fourth successive manuring with those simple substances the produce decreased; that, as is the common expression, the soil became tired of the manure, that at last the field scarcely produced the seed.

It is evident from this, what is the action of the mineral elements in the soil. If in fact,

in the first years, the produce of the soil had increased by the application of bone ashes, or by a single element of the manure—if this increase was dependent on the amount in the soil of the other mineral elements, a certain quantity of those was annually taken up by the plants and removed in the harvest, and a time must at last arrive in which it is exhausted by the repeated removal; the soil must become barren, because of all removed elements only one or the other, and not all of them in a right proportion, have been restored.

The right proportion of the supply is, however, the only true scientific basis of Agriculture.

If we subject the fluid and solid excrements of men and animals to an exact analysis, and compare the elements of them according to their weight, some constant relations between these elements impress themselves upon the mind, the knowledge of which is of some importance.

If the excrements of an animal are collected with some care and left to themselves for some days, their nitrogen appears to have been converted more or less perfectly into ammonia. In the fluid excrements, in the urine, the salts of the food, which are soluble in water, are found in the form of alkaline carbonates, or of sulphates, phosphates, and other salts, with alkaline bases. In the solid excrements or fæces, silica, if it was contained in the food, earthy carbonates, and phosphates are the principal ingredients.

The quantity of alkaline carbonates bears a certain proportion to the amylum, sugar, pectine, or gum of the food. The urine of an animal which has been fed with potatoes or turnips, is rich in alkaline carbonates; the potatoes, however, consist principally of amylum; the chief ingredients of the turnips are sugar and pectine. The urine of a horse which has been fed with hay and oats, is comparatively poor in alkalies, if compared with the former.

It is farther shown that the ammonia or the nitrogen of the excrements bears a certain proportion to the phosphates; the azote increases or decreases with the quantity of the phosphates in a manner that both can serve as a measure for each other, although not quite as an accurate one. It is not quite accurate, because the gum and the amylum also contain a certain, although small, quantity of phosphate of lime, as has been proved in my laboratory.

The ammonia of the excrements is of course derived from the nitrogenous substances in the food: the phosphates are likewise constituents of the latter. In the composition of the food an equally constant proportion exists between both. A given weight of gluten or casein in peas or in grain always corresponds with a certain weight of phosphates; if the grain or the vegetable is rich in these nitrogenous products of vegetable life, it is also rich in phosphates; if it is deficient in them the quantity of the latter decreases in an equal ratio.

As the amount of nitrogen in manure is a measure for its amount of phosphates, and as the manure contains besides these the other ingredients of the soil which are required by the grain or by the other vegetables for their development, and taken up by them from the soil, it is easily conceived what was the cause of the error in regarding the nitrogen of the manure as the principal cause of its efficacy. The reason was, that the ammonia of the manure is always accompanied by the mineral elements which affect its nourishing qualities, because they render its assimilation into the organism of the plant, and its transition into a nitrogenous constituent, possible. Without phosphates, and without the other mineral elements of the food of plants, the ammonia exercises no influence whatever upon vegetable life

If it has been shown that the fertility of the soil depends on certain mineral substances; if the restoration of the fertility of exhausted fields by means of the excrements of man and animals depends on their proportions of these matters; if the effect of the manures *accelerating* the vegetation depends upon their proportions of ammonia, it is clear that we can only dispense with the latter when we provide *all* efficacious elements exactly in those proportions and in that form most proper for assimilation by the vegetable organism in which they are found, in the most fertile soil or in the most efficacious manure.

According to our present knowledge of the effect of the constituent parts of manure, I feel convinced that it is indifferent to the plants from which source they are derived. The dissolved apatite (phosphate of lime) from Spain, the potash derived from felspar, the ammonia from the gas-works, must exercise the same effects on vegetable life as the bone-earth, the potash, or ammonia, which we provide in manure.

We live in a time when this conclusion is to be subjected to a comprehensive and accurate trial, and if the result corresponds with the expectations which we are entitled to form, if the animal excrements can be replaced by their efficacious elements, a new era of Agriculture must begin.

I invite the enlightened farmers of England to unite with me for that purpose, and to lend me their aid. Whatever may be the result of these experiments, it is necessary for the future prosperity of Agriculture that they should be made. They will enrich us with a number of valuable facts—we shall ascertain where we have wasted efficacious matters in the common course of farming—we shall acquire an exact knowledge of those substances which are necessary and of those which are dispensable.

For a number of years myself and many talented young chemists have been occupied with the analysis of those mineral substances

which are constituent elements of our plants of culture, and with the examination of the excrements of man and animals, as well as of a great number of soils acknowledged as fertile. These labors have been before the scientific world long since, but only a very confined application has been made of them in Agriculture.

The farmer is by his position not in the condition to procure and command the efficacious elements necessary for the restoration and increase of the fertility of his fields in a right proportion and suitable form. For this purpose, science and industry must combine their aid.

I have been so fortunate as to remove the difficulties which are opposed to the application of a mere mixture of the elements of manure. If we employ the different elements of manure exactly in those proportions in which they are necessary according to experience, for a rich crop of wheat, peas, turnips, potatoes, &c., and if, at the same time, we leave them in their common state, they do not produce that effect which we might have expected; the cause of this is that the different elements of manure possess a very unequal stability, the ammonia evaporates, the soluble elements are carried off by the rain, and the effect is more in proportion with the amount of those ingredients of the manure which are less soluble.

I have found means to give every soluble ingredient of manure, by its combination with others, any degree of solubility, without altering its effect on vegetation. I give, for instance, the alkalies in such a state as not to be more soluble than gypsum, which, as is well known, acts through many years, even as long as a particle of it remains in the soil.

The mixture of the manures has been adapted to the mean quantity of rain in this country; the manure which is used in summer has a greater degree of solubility than that used in winter. Experience must lead to farther results, and in future the farmer will be able to calculate the amount of produce of his fields, if temperature, want of rain, &c., do not oppose the manures coming fairly into action.

I must, however, observe that the artificial manures in no way alter the mechanical condition of the fields, that they do not render a heavy soil more accessible to air and moisture. For such fields, the porous stable manure will always have its great value; it can be given together with the artificial manure.

Messrs. Muspratt and Co. have undertaken to execute my prescriptions on a large scale, and they are prepared to have ready a quantity of manure in autumn, for wheat, clover, etc., to satisfy the orders of the farmers. One of my former pupils, now Professor of Chemistry as applied to arts and manufactures, in this University, is to superintend the fabrication of these different manures; all necessary guaranties are therefore given as regards their composition.

To prepare for the coming autumn a sufficient quantity of manures, it is necessary that the orders be given at the earliest possible time. It would be very expedient in case that different kinds of soil are cultivated in a farm, to acquaint Messrs. Muspratt and Co. with the fact, as the proportions regarding silica are different for clayey and calcareous soils, to which latter, in order to render them fertile for grain, more of an easily dissolving silicate must be added.

All manure which is to be used during next winter contains a quantity of ammonia corresponding with the amount of nitrogen in the grain and crops which are to be grown. Experiments, in which I am at present engaged, will show whether in future times the cost of this manure can be greatly lessened by excluding half or the whole amount of ammonia. I believe that this can be accomplished for many plants, as for clover and all very foliaceous vegetables, and for peas and beans; but my trials are not so far advanced as to prove the fact with certainty.

(Signed) DR. JUSTUS LIEBIG.

Giessen University, 1845.

Nott's Electric Telegraph.—An experiment, completely successful, was witnessed on Saturday last, in the Isle of Wight, of the powers of Mr. Nott's Electric Telegraph. A perfect and rapid communication was established between East and West Cowes by means of a single wire sunk across the Channel. The telegraphs were attached, one being placed at Medina Hotel, and the other at the opposite side of the Channel, near the Fountain Hotel. The signal bells were then rung simultaneously, and the telegraphs commenced working and communicating questions and answers with the greatest precision and certainty with a galvanic battery of low power, showing that a single isolated wire immersed in the water would carry the electric current a distance of half a mile. The water brought back the current to its source, without the slightest perceptible dispersion or loss of the dynamic power. This experiment demonstrates the perfect practicability of submarine communication, and the question as to its application may be said to be satisfactorily solved. The consequences can scarcely be as yet appreciated, though they are wonderful to contemplate. Instantaneous communication may be established between places divided by estuaries and channels, and islands and continents brought into immediate proximity of correspondence.

☞ A French engineer, M. Doumel, proposes to dig a number of Artesian wells along the great African Desert; and thus to connect Algiers and Timbuctoo.

A GREAT INVENTION IN THE MANUFACTURE OF BRICK.

HALL'S MACHINE—HOW CONNECTED WITH AGRICULTURE.

THERE are so many inventions brought forward under high sounding pretensions to originality and usefulness, which really have not the merit of either, that when something that is labor-saving and valuable is presented, we feel disposed to go a little out of the way to bring it into public notice and favor, even though it be not *exactly* in the agricultural line, as is the case with this brick-making machine of Mr. Hall. The business of brick-making, however, like every other town employment, is connected with Agriculture in ways alike various and obvious. The more people there are in towns and the more prosperous they are, so much the better for the farmer. Whatever, then, has a tendency to make it easier and cheaper to live in town, works well for him of the country; because by increasing consumers it increases demand for all that he of the country has to sell. As the labor-saving inventions of men of genius reduce the expense of building, houses may be supplied in greater number, and rents may be reduced. In this way all improvements in carpentering and brick-making are beneficial to the agricultural interest. To that interest, the occasion (turning up casually as it does,) tempts us to say that nothing can well be more narrow-minded and preposterous than the low jealousy which small-minded men evince and inculcate toward the populations of large towns—a feeling yet more reprehensible when it has any foundation in the envy that some men feel toward those whom they suppose to be more prosperous than themselves. It is very true that the general drift of the legislation of our States and General Government is to favor and protect the concerns of *particular classes* in disregard of the general, and more particularly of the landed interest: but this is the fruit of their own (the country people's) want of concert, intelligence, and spirit to *take care of themselves.* More especially is it the fruit of defective education in all that is particularly calculated to enlighten them in the practical principles and the political rights of Agriculture: and so will it ever be until they begin to *think* and to *act for themselves*—and until they give proper support to presses devoted to their welfare. In this country, above all others, where the Press is free, it is all powerful. It forms and sways public opinion, and dictates the legislation of States. The editors are at once our schoolmasters and our preachers. Well, see how they stand in relation to the two great concerns of society—Education and Agriculture! Take Maryland and Virginia as examples. In Maryland we have, at the lowest calculation, papers made up of news, party politics and advertisements:

Weeklies	42	Dailies	5
Total			47.

In Virginia—papers made up of news, party politics, and advertisements:

Weeklies—Tri and Semi-Weeklies	34	Dailies	8
Total			42.

While there is not one, that we know of, elucidating the great subject of *education,* and the agriculturists have appropriated to their pursuit *one only in each*

State—and these published at only one dollar a year, and poorly supported at that—*Even one bushel of corn is grudged for papers* either one of which, if read and followed with attention, would teach them to add at least two bushels to every acre they cultivate! What care can such people have for their own minds? What for the intellectual character and power of their own sons in reference to the very business of their lives? But how can one reason or write with patience in view of facts so calculated to overcome the mind with surprise, not to say disgust! Well, what has all this to do with *Mr. Hall's Brick-Making Machine?* So let us return to that.

A much respected correspondent and friend having written to us respecting Mr. Hall's Machine, led to a personal interview with him, in the course of which he placed in our hands the accompanying description, as published in The Farmer and Mechanic. We only take enough of it to gratify the curiosity of the general reader, and to give an idea of what the machine will do. To go farther into a description of the manner of laying off brick-yards, and the details of drying and burning, would be to wander too much from the design of this work, and to occupy more space than we have at command.

The engraving represents a machine for making brick patented in the United States and Great Britain, by ALFRED HALL, of Perth Amboy,* New-Jersey, showing a pit in which the clay is soaked, the mill for grinding it, and a moulding machine as attached when in operation.

From four to five hands compose what is called the moulding gang: the shoveler, called a machine tender, a moulder, and from two to three off-bearers. These must all move on regularly, and keep up with the horse; they will make from eight to fourteen thousand bricks per day, the number depending upon the size of the brick and the convenience of the work.

Various statements have been published, for which we have not room. At some inconvenience we *make* room for the following, and will here say that we should repose full confidence in any statement of facts that Mr. Hall would make about the merits and capacity of the machine.

AMBROSE BAKER, of Coxsackie, N.Y., thus remarks: "I have made bricks twenty-two years—nineteen years by hand, and the last three years with Hall's machines. I have six machines—running three alternately each day. I have made this season 3,300,000 in five months, with twenty-seven men—at least one-fourth more than I could have made with the same number by hand. They were all moulded by three men, and the quality is greatly improved—being more dense, and having a smoother surface. 25,000,000 have been made with these machines at Coxsackie the past season, and they have caused an entire revolution in the brick manufacture. The machine works like a charm. Numerous kinds had been tried, and great expense incurred, but no machine would work our clay successfully before we tried this. Now, none of our brick-makers could be induced to dispense with them."

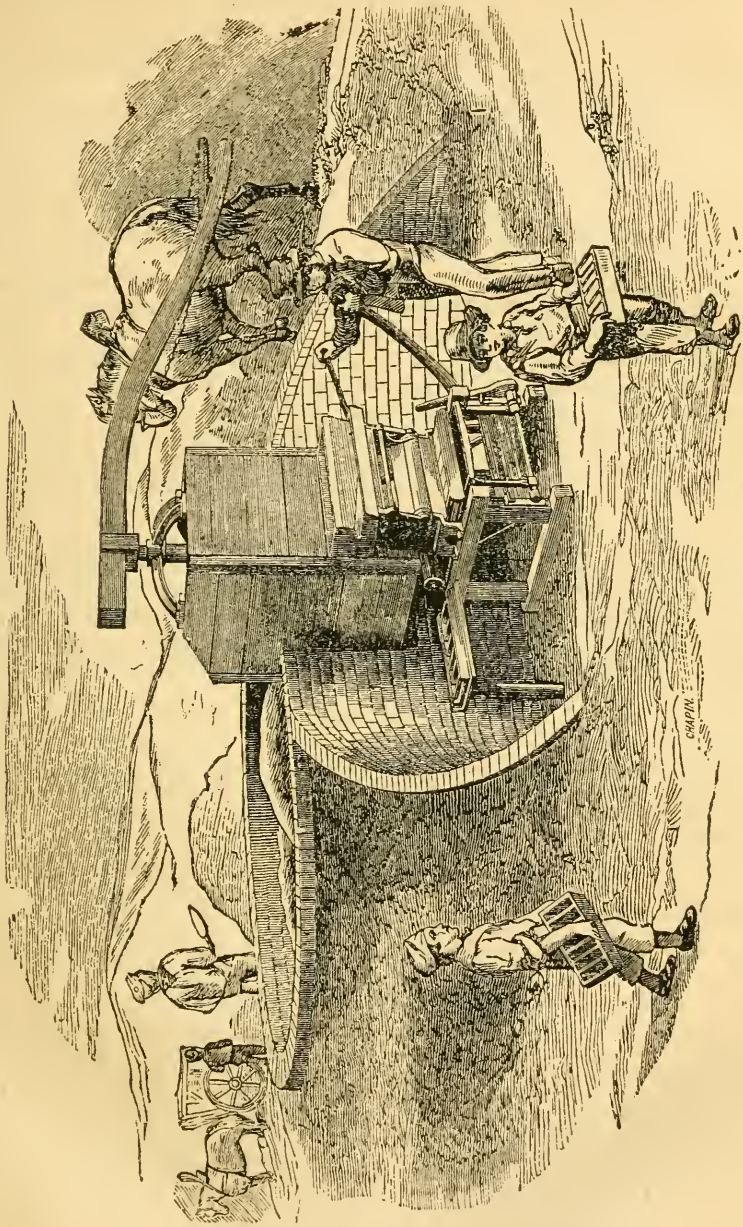
EDWIN WILSON, of Rochester, stated *before the Institute* as follows: "I have made brick at Rochester for twenty years—made 1,500,000 the past season in less than five months, with *one* of Hall's patent machines, for which I gave $200. I want another, but the holders of the patent for Rochester will not sell me one for any price. As I cannot get another, I would not take $1,500 for this. I employed eleven men, and have sold my brick, delivered, for $3 per thousand (it costing 63 cents per thousand to deliver them,) and have made a fair profit. Mr. Buckland's brick are used for *fronts*, instead of *pressed brick*, and I think no more pressed brick will be used at Rochester, as those made by the machine present as good and handsome fronts as the pressed article."

WILLIAM WORMAN, of Allentown, Pa., remarks: "My business this season has been first rate, and although the machine was started late, I have made 600,000 with it, and No. 1 bricks too. I like the machine better every day, and am satisfied that I can make more and better bricks than any other establishment in the country."

PETER HUBBELL, of Charlestown, Mass., states, in a letter to the Institute, Dec. 9, 1846: "We have been engaged in the manufacture of brick for the last twenty years, most of the time on the Hudson River; but for three years past in this State, within four miles of Boston. During all this time we have sought for and adopted many of the improvements in the business, many of which we have cast aside as worthless. Moulding machines were invariably placed with the latter class, until

* Recently from Coxsackie, New-York.

we found and adopted Mr. Hall's machine, which we have used for the last three years, in different and nearly all kinds of clay, to our entire satisfaction. It is simple in its construction, easily kept in order, and can be worked by men of the most ordinary capaci-



HALL'S BRICK-MAKING MACHINE.

ty, moulding with ease from ten to twelve thousand per day, and better bricks than can be moulded by hand or by any other machine. We have had thirty of them in use for the last three years, using fifteen of them alternate days, making each year about 15,000,000 bricks, and for that time the expense of repairing them not exceeding *ten dollars*."

The (London) FARMER'S MAGAZINE, speaking of this machine, says: "It is the invention of an American brick-maker, and in general operation throughout the United States. It is so simple and efficient in its construction and performance, that it seems destined here also to take the lead. It consists of a pug-mill upon an improved principle, to which the moulding apparatus is so attached that the clay, after passing through it, is forced immediately into a series of moulds prepared to receive it. The bricks made by this machine are much sounder and better than those made by hand; and with the power of one horse and two men, from 8,000 to 10,000 bricks can be produced per day.*"

Communications should be addressed to "A. HALL, Perth Amboy, N. J."

INTRODUCTION OF ALPACCAS INTO THE UNITED STATES.

WE had the satisfaction to announce to the Farmers' Club, at a late meeting, and have much pleasure in repeating it here, that the heads of Departments at Washington, with an alacrity that entitles them to great credit, gave all the orders necessary to facilitate the transportation of Alpaccas from Peru to the United States in Government vessels. Mr. J. D. WILLIAMSON having presented himself at Washington as the agent of the Agricultural Association of New-York, charged with that subject, a free passage was granted him at once handsomely and cheerfully, in one of our national ships, with permission to bring home as many of these sheep as can be conveniently accommodated on board, together with any seeds or plants that may be selected by him with a view to the promotion of improvement in, and addition to the stock of our agricultural and horticultural products.

These facilities were granted, of course, with the sanction of the Chief Magistrate, who, in lending his countenance to the enterprise, probably had in his mind the example of His Majesty the Emperor of China, the "brother of the Sun and Moon," who in the presence of admiring thousands, once a year takes the handles of the plow. We doubt if either of them was ever employed in a manner more conducive to the zeal and welfare and true glory of their country: not for the results of the particular act, but for its influence as an example.

RHUBARB TARTINE.—The inclosed recipe for making what I call, for want of a better name, "Rhubarb Tartine," will, I think, be of some use to cottagers, and others, as a cheap mode of using Rhubarb, and especially to those who find pastry unwholesome. Take as many Rhubarb stalks as will fill a baking-dish, and lay them in water for ten minutes; then grease a dish for baking, and put at the bottom of it some bread cut in slices about a quarter of an inch thick, toasted and soaked a few minutes in some boiling water poured into a plate with two table-spoonfulls of moist sugar in it. Cut the Rhubarb in pieces an inch long, and fill the dish; then put some slices of toasted bread soaked as before, to cover the top, and bake it about an hour and a half, or until well done. If the crust be cut from the bread after being toasted it will be the nicer. [English paper.

LIME *vs.* THE POTATO DISEASE. Having a few potatoes planted last year, which were infected by the prevailing disease, our gardener was instructed to try the experiment of putting a little quick-lime upon each plant, which was done, and when the tubers were taken up a few weeks afterward, they were found to be perfectly sound, but as a farther precaution they were put into bags with a very small quantity of quick-lime, and when taken out a few days ago they appeared to be perfectly free from taint. It is our intention to follow up this plan this season if necessary, and we recommend others to do likewise.

[Messrs. Beck, Henderson & Co., Middle Wharf, Adelphi, April 1847.

☞ The British Colonies occupy an area of 2,119,708 square miles, with a total population of 107,708,323. Their exports and imports amount to £55,533,500.

* Should have added two boys for carrying off.

DAIRY HUSBANDRY—THE DAIRIES OF HOLSTEIN.

The use of steam every year for a greater variety of purposes, the laying down of rail and plank roads, and opening canals, are working revolutions in the industrial economy of all sections of the country. This liability to change of circumstances requiring corresponding changes in the habits and pursuits of different localities, imposes the necessity for a greater variety of knowledge—that is, for a practical knowledge of a greater number of pursuits than formerly.

A grazing district this year may next year be converted into a farming one by being penetrated by a railroad and presented with facilities for transportation which it had never before enjoyed. We have long been impressed with the belief that, along with their fine climate, and cool fountains, and fragrant herbage in the mountain regions of the Southern States, there should be large flocks of sheep and ample dairies for the manufacture of butter and cheese—articles that, if well made, will bear to be kept until remunerating prices will pay for producing and sending them to market. To some of our patrons who entertain the same views—in fact to every curious and polite inquirer, we feel persuaded we may be making an acceptable offering in the following paper on

THE DAIRIES OF HOLSTEIN.

Holstein butter is said to be (with the exception of that made in Holland proper) the best in the world. It may not be uninteresting to our readers to describe the process adopted in that Duchy for making that valuable article.

The Duchy of Holstein (together with the Duchies of Schleswig and Lauenburg) lies in a favorable position for commerce, being bounded by the Elbe and the German Ocean on the west, and by the Baltic on the east, while a ship canal unites the two seas. The climate is temperate, inclining to moisture; it does not materially differ from that of the midland country of England, except that the cold is more steady and severe in winter, while the summers are warmer and drier. The night-frosts in April and May are the most unfavorable circumstance affecting the interests of Agriculture; they are felt more than in England because the heat of the sun in the daytime is greater and the contrast, therefore, the more prejudicial. The soil is rich, and often receives accessions from the depositions of the river Elbe. The peculiarities of management in the Holstein dairies relate to the buildings and utensils; to the time of milking and number of hands employed; to the management of the milk; and to the mode of working, salting and packing the butter. These have been described by Mr. Carr in a communication to the Royal Agricultural Society, and may be thus shortly stated:

The buildings on a large dairy are a milk-cellar, a butter-cellar, a churning-house, with a horse-mill adjoining, a cheese-room and a kitchen, in which the utensils are washed and food is cooked for all persons immediately engaged in dairy work; to which are sometimes added their sleeping-apartments. The size and situation of the milk-cellar are deemed of great importance: it fronts the north, and is shaded from the summer sun by rows of trees, the elder being chosen especially, and planted as near the windows as possible, on account of the influence of this tree in keeping off insects. A thatched, projecting roof affords protection from the heat, and great care is taken in choosing the site of the dairy to place it out of the reach of anything that might taint the atmosphere. The size of the milk-cellar is regulated by the number of cows, but it is generally calculated to contain the produce of four milkings. The milk-dishes are placed on the floor, and usually occupy the space of two feet square each. Thus the produce of one hundred cows giving on an average eight quarts per day, would fill fifty milk-dishes at each milking, and would require a ground surface of five hundred square feet, as there must unavoidably be space left to enable

the dairy-maids to go through their various operations. The floor is sometimes flagged, but oftener of brick neatly fitted, so that no water may lodge in the joints, and always gently inclined, with a grating at the lower end to facilitate the washing of the floor, which is never omitted to be done twice a day, notwithstanding that every source of impurity is guarded against and every drop that may fall at the time of the milk being strained is carefully wiped up. A recent improvement is the dividing the floor into compartments with brick ledges from three to four inches high, between which the milk-dishes stand; the lower extremity of these compartments is fitted with a small sluice, and twice a day they are filled with cold water from a pump. Thus the milk is preserved so cool as to prevent all approach to acidity for several hours longer than when placed on a dry floor. In sultry weather a piece of pure ice is sometimes dropped into each milk-pan, or a pailfull of ice is placed in the dairy, which, by absorbing the heat, sensibly lowers the atmospheric temperature.

The best milk-cellars are sunk from three to four feet in the ground; they are from sixteen to eighteen feet high, with an arched roof, and two rows of windows looking north, east and west, to secure a thorough air. The lower range of windows consists of wooden trellis-work, provided inside with gauze frames, to exclude insects, and outside with hanging shutters, which can be lowered and elevated at pleasure. The upper range is furnished with glass sashes, which are exchanged for gauze frames when greater coolness is needed.

The butter-cellar also is light, airy and cool: it is likewise sunk in the ground and supplied, by the same means as the milk-cellar, with plenty of pure air. Here the butter, when carried from the churning-house, is worked, salted and packed. The filled butter-casks are ranged on clean boards a little elevated from the floor, to allow of a free passage of air, and are turned and wiped every week. Next in order comes the churning-house, which has much the same arrangements as we find common in England. Of late years the perpendicular movement of the churn-staff has been exchanged for the rotary, which is found to churn in a shorter time, and with less risk of oiling the butter. The cheese-room in these dairies is placed as far as possible from both the milk and the butter-cellars.

The persons required to conduct the business of the dairy are an overseer, a cooper, one or two cowherds, one or more swineherds, an upper dairy-woman, and dairy-maids in the proportion of one to every eighteen cows. The overseer takes care of the cattle, and is expected to know their diseases and the remedies. He is responsible for the conduct of the swineherd and cowherd, and superintends the fatting and rearing of calves. He also sees that the milking is thoroughly performed. When the number of cows does not exceed a hundred, he also undertakes the cooper's work; but in large dairies a cooper is kept in addition, who, besides his particular duties, assists in carrying the milk, feeding the cows when housed, &c. The wages of these two persons vary with the extent of the dairy, but may be averaged at sixty dollars for the first and forty for the second per annum.

The dairy-maids, besides milking, cleaning the vessels, &c., work in the garden in summer, spin in winter, and wash, bake, brew and cook for the establishment under the direction of the upper dairy-woman, who is by far the most important personage therein, as on her skill, attention and diligence depend, in a great measere, both the quantity and quality of the product. She must not only thoroughly understand, but accurately observe, the moment when the milk should be creamed; the degree of acidity it must attain in the cream-barrels; its temperature, whether requiring the addition of warm or cold water to the churn; as well as the subsequent operations of kneading, beating, salting and packing the butter. She must be punctiliously clean in her person and work, and require the same cleanliness of her maidens. In large establishments the upper woman has full employment without milking, and even requires assistance in her own department; but in smaller dairies she milks about ten cows. Her wages are from fifty-five to sixty dollars per annum, while her chief assistants receive twenty-two and the rest eighteen dollars.

During summer the dairy people of Holstein rise at three, or even two, in the morning, if the weather be very hot; for which exertion they are allowed two hours' sleep in the middle of the day. The milking is carried on in the field,

generally commencing at four, and lasting two hours. Each girl marks her own cows, by tying a particular colored ribbon around their tails; and in some places each milker carries a string, on which a knot is made for every cow that is milked, to prevent any from being forgotten. The fields are large, and often at a great distance from the dairy, but the milk is safely and easily transported by means of a long, low, four-wheeled one-horse wagon, in the side-bars of which strong iron hooks are inserted at such distances that the milk-pails, containing from thirty to forty quarts each, may swing free of each other; and these, though filled nearly to the brim, are prevented spilling by merely having thin pieces of wood, about the size of a dinner-plate, floating on the surface. The milk, when brought to the dairy, is immediately strained through a hair-sieve into the vessels placed to receive it. These vessels are of various materials: they may be of wood, earthenware, copper tinned, zinc, cast-iron lined with a China-like composition, or glass.

In order to secure butter of a first-rate quality, the cream is removed from the milk before any acidity is perceptible, and it has been found that a cellar temperature of from 60° to 62° Fahrenheit is the most favorable, allowing a complete disseverment of the cream in thirty six hours; whereas a greater degree of warmth, while it quickens the separation, still more hastens the souring process, which injures both the quantity and quality of butter. In a cold temperature the separation is effected much more slowly, so that forty-eight and even sixty hours may be required; this, however, is the longest period which can be given without the risk of imparting a rank, unpleasant flavor to the butter. The first signs of acidity in milk are a very slight wrinkling of the cream, and a scarcely perceptible acid taste. The moment this is observed, the skimming commences, even if the milk have stood but twenty-four hours. The cream is poured through a hair-sieve (which is kept for the purpose and never employed in straining the new milk), into large barrels, containing about two hundred and forty quarts each, in which it remains until it is sufficiently sour, being stirred at intervals to prevent its becoming *cheesy*. The next object of the dairy-woman's skill is the degree of warmth or coolness which must be imparted in order to secure good butter.

In warm weather the churn is rinsed with the coldest water, in which a piece of pure ice is often thrown, and sometimes, though more rarely, cold spring water is added to the cream about to be churned, which operation is then always performed either very early in the morning or late in the evening. In cold weather, on the contrary, warm water is applied both to rinsing the churn, and to the cream itself.

The churning being completed, the butter is taken off by means of a large wooden ladle, and carried in a tub directly to the butter-cellar, where it is cast into a large trough, hollowed out of the trunk of an oak or beech, very smoothly polished inside, and provided with a plug-hole at the lower extremity, beneath which a small tub is placed to receive the expressed milk. There the butter is slightly worked, and salted with the purest salt, then moulded with a wooden ladle into a mass at the upper end of the trough, and left for some hours to soak and drain. In the evening it is thoroughly kneaded and beaten, or rather slapped, the dairy-maid repeatedly lifting a piece of from three to four pounds, and slapping it with force against the trough, so as to beat out all the milky particles; and thus lump after lump being freed from extraneous matter, the whole mass is spread out, receives its full proportion of salt, about an ounce and one-eighth per pound, which is worked with the utmost care equally through it, and again moulded into one compact mass. The butter in Holstein is scarcely ever washed, as water is believed to rob it of its richness and flavor and to be unfavorable to its preservation.

When a quantity is ready, sufficient to fill a cask, the several churnings are once more kneaded through, a very little fresh salt added, and the butter is packed in a barrel made of red beech-wood, water-tight, which has been prepared by careful washing and rubbing on the inside with salt. Great care is taken that no space shall be left either between the layers of butter, or the sides of the cask. In large dairies a cask is never begun to be filled until it can be completed, as thus alone the butter can be exactly of the same flavor and color throughout. The qualities of the excellent butter on which the Holsteiner prides himself, are *first*, a fine, even, yellow color, neither pale nor orange-tinted; *second-*

ly, a close waxy texture in which the extremely minute and transparent beads of brine are perceptible; but if these drops be either large or in the slightest degree tinged with milk color, it is considered as marking an imperfect working of the butter, while an entirely dry, tallowy appearance is equally disapproved; *thirdly*, a fresh fragrant perfume, and a sweet kernely taste; *fourthly*, the quality of keeping for a considerable time without acquiring an old or rancid flavor.

There are four qualities or varieties of butter known in Holstein. These are named, *Fresh-milk*, *May*, *Summer*, and *Stubble* butter, according to the season in which each is produced. The Fresh-milk butter is that made in the spring, between the time when the cows calve and their being turned out to pasture. The May butter is that produced in May, after the cows have been sent to grass. This is highly prized for its peculiarly fine aroma when fresh, but is found not to keep well, and, therefore, like the Fresh-milk butter, is generally sent to market as it is made. The Summer butter is made in June and July, and from that time till the cows are removed from pasture, the butter bears the name of Stubble butter. Both these latter sorts, if properly made, keep well, and retain their fine flavor nearly unimpaired until the following spring. The small quantity produced between the time of the cows being housed and becoming dry, is called *old-milk* butter, and is least of all esteemed.

In winter, when the cows are confined to dry food, and the butter loses its fine yellow color, artificial means are employed to remedy the defect; for the Holstein merchants find that without the usual degree of coloring, their butter will not in some markets (as in Spain and Portugal) fetch its accustomed price. The ingredients used for this purpose are a mixture of annatto and turmeric, in the proportion of five ounces of the latter to one pound of the former. These ingredients are boiled in butter for half an hour, stirring them frequently, and then straining through linen. The preparation can then be kept for use. When butter is to be colored, a portion of this mixture is melted over the fire: it is then poured into a hollow made in the mass of fresh churned butter, and by rapid stirring is intimately united with the butter immediately in contact with it, which being then spread over the whole mass, is, together with the requisite proportion of salt, carefully kneaded and worked through until no particle remains more highly colored than another; and when smaller portions have thus been colored from day to day, before a cask can be filled, the whole must, before packing, be kneaded once more, that no disparity of shade may disfigure it.

The greater portion of the butter made in the dairies of Holstein and Schleswig, is bought up by the Hamburgh merchants, though it is likewise sent in considerable quantities from Keil and other parts to England and Copenhagen, and the West Indies.

We have already noticed the importance attached to every particular relating to the milk-cellar, and the utensils employed in making this celebrated butter. The different materials used for milk-pans were named, and we may now give some farther notices from the same authority on this head. Various kinds of utensils have been tried in Holland, in the hope of discovering how, in hot weather—more especially when a thunderstorm is gathering—the milk can be kept from too early an acidity. Those in most general use are shallow wooden vessels, nearly of an equal diameter at top and bottom, containing, when full, eight quarts—but in which, during summer, seldom more than six quarts are poured The chief disadvantage of these vessels is the great labor and attention required to remove all acidity, which, in some states of the atmosphere, is almost unavoidable; and which, penetrating the pores of the wood, sometimes resists all the patient scrubbing, first with hot water and small birch-scrubbers, and secondly, with boiling water, and a hard round brush made of pig's bristles, with which every part of the utensil is carefully polished over. Sometimes the dairy-maid is compelled to resort to washing in a lye of wood-ashes or boiling, or even scorching over lighted chips, followed by countless rinsings in pure spring water. To diminish this labor the milk-venders in town paint the milking-pails and dishes with a preparation of cinnabar, linseed-oil and litharge; but this is expensive, for the vessels require three coats of the composition at first, and one yearly afterward—and, after all, the milk, for some days after these vessels are brought into use, has a perceptible taste of paint. Tinned copper milk-pans are very

costly, and require constant watching, lest they should require re-tinning. The zinc pans are yet but little known, and their value not sufficiently proved. Cast-iron lined with enamel are durable and very clean, but too expensive. Glass pans have many opponents on account of their brittleness. The testimony of Mr. Carr, however, is *decidedly in favor of this material.* He says that in his dairy (which is supplied by 180 cows,) the glass vessels have been used for four years. They are sixteen inches broad at the top, and twelve at the bottom: the glass is dark bottle-green, transparent and perfectly smooth, about one-eighth of an inch thick, and furnished with a round rim at the upper edge, which makes it easy to retain a safe hold of them even when full. They would contain eight quarts, but never receive more than six. "They cost eight-pence apiece, and their durability may be estimated by the fact that, to encourage carefulness, each dairy-maid is allowed one dollar extra as pan-money, being bound at the same time to pay ten-pence for each one she breaks; yet hitherto," says Mr. Carr, "no girl has broken to the extent of her dollar." The great advantage of these vessels is in the saving of time, fuel and labor they effect, for they merely require to be washed in luke-warm water, then rinsed in cold water, and put in a rack to dry. Supposing, therefore, (which Mr. Carr does not admit,) that the milk, during summer, becomes sour sooner, and consequently throws up less cream, in glass than in wood, this disadvantage would be more than counterbalanced by the diminished expenditure of glass vessels; for, of course, where time and labor are saved, the number of domestics may be lessened.

Cow-houses in Holstein are generally twice as long as broad, and calculated for four cows lengthwise, standing head to head, with passages between, floored with brick, and furnished with feeding and drinking troughs. One passage, if not both, is broad enough to admit a loaded hay-wagon, and is provided with large folding doors at each end, while there is also room behind the cattle sufficient to permit the manure being sledged out with a horse without incommoding them. The lofty roof affords accommodation for hay and straw, which helps to keep the house warm in winter; the doors are kept shut as much as possible during that season, sufficient light being admitted by small glazed windows. The quantity of food which can be afforded to cows during winter is ascertained as soon as the harvest returns are known. In plentiful seasons the calculation is that each cow should be allowed three sacks of grain, (generally oats, 140 pounds each sack,) 3,900 pounds of straw, including bedding, and 1,800 pounds of good hay; while for every hundred pounds of hay less, she receives twenty-five pounds of grain more, or *vice versa.*

There are three distinct breeds of cattle in the Duchies—the native cow, the marsh cow, and the Jutland cow. The first is middle-sized, with fine head and horns, and moderately thick neck; the color generally red or brown, though often yellow, black, or spotted. The District of Angeln produces the finest specimens of these cows, which are considered to yield more milk in proportion to the food they require than any other kind. The marsh cows are large-boned, generally red, and require luxuriant pasture. They thrive well in the marshy delta of the Elbe, giving from twenty-four to thirty-two, or even forty quarts, when in full-milk, daily; but the return of butter is much smaller, and of inferior quality to that of the Angeln cattle. The Jutland cow is fine in bone, rather lengthy than deep in body, but not generally long-legged. The usual colors are gray, dun, or black, or either of these spotted with white. They are distinguished for fattening easily, and are not much prized for dairy purposes.

The average quantity of milk obtained from good stock is estimated at from 2,000 to 3,000 quarts per annum, according to the food and care bestowed on the cows. The produce has been calculated thus: every 100 pounds of milk will give 3¼ pounds of butter, 6 pounds of fresh cheese, 14 pounds of buttermilk, (exclusive of the water added before and after churning,) and 76 pounds of whey; and though the different circumstances affecting the cows cause a great variety in the results, still it is considered a fair average that fifteen quarts of milk are required for a pound of butter; for although from some cows a pound may be obtained from twelve quarts, yet others, and even the same cows at different seasons, and with different food, (such as beet, or raw potatoes,) will not produce a pound of butter from less than seventeen or eighteen quarts. On the whole, it is esteemed a fair return, in these Duchies, when the average produce of the dairy amounts to 100 pounds of butter, and 150 pounds of cheese, per cow.

The above particulars will, we doubt not, prove interesting to many of our readers who may be concerned in the business of the dairy, and may, in some cases, supply a few hints of practical utility; for there is much to admire and something to copy in the numerous precautions taken by the Holstein dairy-farmer to insure an article of first-rate excellence as the product of his industry.

NOTE.—The recent liberation of glass from all duty, now affords manufacturers an opportunity of supplying our dairy-farms with milk-pans made of that beautiful material.

MADDER.—PRODUCTIVE FARM.—PROFITABLE COW.

The following articles were cut from a Western paper—we suppose the Prairie Farmer—without preserving the title of the paper at the time.

Our soil and climate being perfectly well adapted for the growth of Madder, if farmers had as much influence as Congress, as even their *corn-fodder* entitles them to, the growth of it would be so encouraged as to give us a chance of making it, against the pauper labor of Europe.

CULTURE OF MADDER.—*Messrs. Editors:* In the time of the last War with England, when Madder could not be imported, it retailed for from 75 to 87½ cents per lb. My father seeing some directions in an almanac, planted the first year about half an acre, being all the sets he could obtain. The result of this crop I do not remember. The next year we put out one acre, lacking sixteen rods, which produced 2,300 lbs. of ground Madder, which was sold wholesale at $65 per 100 pounds. It was raised on oak land, that had been cleared some forty or more years; clay soil—land prepared in the following manner: about seventy loads of manure, then planted in potatoes to ameliorate the ground, and the next spring plowed well and deep. Several crops were raised afterward, but not with so good success.

Now for the process. The land should be rich, well and deeply plowed, and thoroughly pulverized. The soil should be deep and contain considerable sand. Commence six feet from one side of your ground, and throw two furrows together. Now you are ready for putting in the sets, as follows; when the Madder roots rise to the hight of eight or ten inches, draw them out from the old bed, from five to ten plants at a time, taking care to draw the part of the plant that is in the ground, which is yellow, and is commonly from two to four inches long; place them in baskets and carry them to the place of planting. Lay the plants on each side of the ridge thrown together by the plow, four or five inches apart, or six if scarce; then go two rounds, taking a light furrow. Then lay your sets as before, and so on, so as to have three rows of plants on each side of the center, which will make six rows of plants, and the bed when so completed should be about six feet wide. Now commence the second bed, so as to leave four feet of space between the beds when finished.

Now nothing more is to be done except to keep it clear of weeds, and the intervals between the beds frequently stirred with the plow, till toward harvest, when the plants appear sufficient to cover the beds well. Then weed clean, stir the middles, lay the tops in, so as to form a straight edge to the beds. If thin places occur, from failure, turn some of the top so as to at least partially cover the ground. Now pat all the tops down lightly with the head of a rake. Take a shovel, and with the loose ground in the intervals cover the beds in small ridges crosswise of the bed, a shovelfull making eight or ten inches of the small ridge, and leaving from two to four inches between the small ridges: if entirely covered, the tops will smother. The covered tops will become crown roots, and soon will shoot up numerous young plants. Now if the second growth comes on so that it can be covered before the middle of August, proceed and cover as before, as this will much increase the crop. It is most convenient to cover one-half of the bed on each side of the interval. Keep the beds clear of weeds till fall. The second summer pull out all weeds and bunches of grass that would smother the plants, which is all the cultivation that is needed.

In the spring of the second season draw your plants for setting the second crop. In the fore part of September of the second season, you can commence digging your crop, cleaning out the old tops and yellow shoots. If plants are wanted for transportation, now is the time to save them; save the crown plants and cover them six or eight inches deep with earth. The small shoots before described will not answer to carry but a few miles. The roots can now be put in baskets

and washed, and they are ready for use by pounding them well in an iron kettle.

The process of washing, drying, and grinding, and packing on a large scale, that is to make a business of it, would require an additional chapter on the subject, which is not needed where it is only cultivated on a small scale: which information I am willing to communicate to any correspondent, or for publication if requested, to the best of my ability, though I am unaccustomed to writing for publication.

We raise principally for our own use, so that I could not supply crown roots for more than a few thousand sets.

Mr. Joseph Swift, residing on Vermilion River, about seven miles from Lake Erie, in the north-west corner of Lorain County, Ohio, is the most extensively engaged in the cultivation of Madder of any man I know of in the Western States. M. Moyer.

Niconza, Miami County, Feb. 1847.

A Productive Farm.—*Messrs. Editors:* Mr. Mordecai Abraham is a neighbor of mine, living upon rented land, and pays $1 50 per acre for ninety-six acres. He has just given me the following items as the amount of his crop for the year 1846. His farm has been worked exclusively by himself and son, with a team of two horses.

	Bushels.
28 acres Winter Wheat	858
9 acres Spring Wheat	164
39 acres Corn	2,050
5 acres Oats	300
¼ acre Potatoes	50
A patch of Onions	7
Total	3,429

In addition to the above, Mr. A. had 1½ acres of flax, which was a good crop, but not saved for want of time; and three to four acres of spring wheat which he was unable to harvest. He also had nine acres of good timothy hay, which was well saved; and one hundred and sixty bushels of apples, one-half of which were sold for fifty cents per bushel.

The wife and daughters made a piece of silk—enough for eleven handkerchiefs, which sold for $1 50 each, and they have kept a hand-loom in motion for most of the season.

For harvesting and threshing, Mr. A. paid 161 bushels of wheat, which, with the $144 rent, shows the amount to be deducted from the above, in estimating the value of the labor of the family.

I send you this for the purpose of showing your readers abroad what *two men* and *two horses* can do in the way of furnishing something to eat, when they set themselves to work upon our prairies. The land upon which the above crop was raised is not above a medium quality of the lands in this region; and I verily believe there are 30,000 sections or square miles in the State which are as productive as the farm in question. If I am right in this opinion, there are then 120,000 quarter sections which might be made as productive as the one upon which Mr. Abraham raised the above crop. Again, we have some 20,000 square miles not so fertile, which may be set down at half the productiveness of those first named—equal to 40,000 more quarter sections—making in all 160,000 farms of equal productiveness with the above. Now if you will take the trouble to *cypher up* how many people could live comfortably upon the provisions raised by Mr. A. as before stated, and then multiply that number of people by 160,000, you can, I think, give a pretty shrewd guess how many human beings can be fed upon the productions of Illinois when the same shall be brought into tolerable cultivation. E. Harkness.

Fruit Farm, Peoria County, Feb., 1847.

Mr. Phelps's Durham Cow Victoria.—*Messrs. Editors:* In redemption of the pledge made you when last in your city, and in obedience to the wishes of our mutual friends, who have solicited it for your columns, I send a brief notice of my Durham cow Victoria.

She was calved on the 30th day of March, 1841, and slaughtered on the 6th day of January, 1847, being 5 years, 10 months, and 7 days old—has had four calves at three premature births, none of which have been reared.

Her standard hight was	4 feet 8 inches.
Length from horns to tail	7 .. 4 ..
Breadth across the hips	2 .. 1½ ..
Size in the girth	7 .. 9 ..
Weight on foot	1890 lbs.
Net weight of quarters	1312 lbs.
.. .. hide	98 ..
.. .. rough tallow	176 .. —1586
Loss in slaughtering,	304 lbs.

She would probably have weighed 2,000 lbs. had she been kept until maturity.

Journalizing the weight of animals having become somewhat fashionable, I will add that I marketed with Messrs. A. D. & H. Reed of Farmington, the present season, fifteen hogs, averaging 416 lbs., the lightest weighing 332 and the heaviest 524 lbs.

William J. Phelps.

Elmwood, Peoria County, Feb., 1847.

☞ A baker of Berne, in Switzerland, has succeeded in making very palatable bread from Iceland Moss. It results from a scientific examination of this bread that out of 102 parts, it contains 44½ of fecula or nutritive matter. Bread made chiefly of potatoes is said to contain only 15 in the 100 parts of nutritive matter. [Galignani.

☞ In Germany the Government of one of the southern States, has ordered that athletic schools, to promote the full development of the human frame, should be considered as belonging to the ordinary category of youths' training.

TO FARMERS' CLUBS.

A WORD FROM THE EDITOR OF THE FARMERS' LIBRARY.

We respectfully recommend that with your monthly meetings for oral discussions you connect the establishment of *small libraries* of choice books, of which, if requested, we shall be happy to furnish a catalogue according to our best judgment. Of course we should recommend subscription to all the agricultural journals, as they would amount to almost nothing. But as most of them treat almost altogether only of practical Agriculture, we would suggest works that are not embraced in them, and that treat of the Natural History and Physiology of trees, plants, birds, animals, fishes—in short, of the various forms of animal and vegetable life with which the farmer is in contact or surrounded, and of which it is almost disgraceful for country gentlemen to be entirely ignorant. Now as we know the inertness which belongs to people of certain habits of life, and how much they require, not only to have the food provided for them, but almost to be fed, we will annex a rough draft of Rules for the government of such a Book Society. What a fine example it would be for fathers to set to their sons! Take these Rules, for instance; they may be modified at pleasure:

FARMERS' BOOK SOCIETY, WILMINGTON.

RULES.

I. Doctor J. W. Thomson to be Chairman; ——, Treasurer; ——, Secretary; ——, Librarian.

II. The annual subscription of each member shall be $1, together with an admission fee of 50 cents, the first subscription to be paid immediately on the commencement of the Society, and that of each succeeding year, together with all fines, at the annual meeting in ——; and if the same be not paid before the monthly meeting in ——, the defaulting member shall be considered as having withdrawn from the Society, and shall forfeit all farther right and interest in the books.

III. The members shall meet at ——, on the first —— in every month, (excepting the month of ——, when the annual meeting will be held,) at the hour of seven in the evening; and business shall be commenced at a quarter past 7, by whoever members there are present.

IV. Each member shall be entitled to propose a book; but no book shall be purchased unless it be approved of by two-thirds of the members present. No member to propose a book of a price exceeding his annual subscription; but two or more members may join in proposing a book of a price equal to the amount of their united subscriptions. The proposer or proposers of a book shall be entitled to the first perusal of the same, and as soon as returned it shall be circulated in an order settled by lot. If any member neglects to name a book within three months from the annual day of meeting, his right of naming one shall merge into that of the members at large.

V. No member shall be allowed more than one volume at a time during the first year; and all books shall be returned to the Librarian on or before 7 o'clock in the evening of each monthly meeting; and any member keeping a book over the time shall pay a fine of sixpence per day for every day the book shall be so kept. And if the book shall be lost, torn, or materially injured, the member shall make good the same.

VI. Any member may be allowed to transfer a book to another member at any time between the monthly meetings, and the member to whom such book may have been transferred shall alone be responsible for the due return of the same in proper condition, and shall be liable to all fines which may accrue should the book be kept beyond the prescribed time—but no book may on any account be lent to a non-subscriber.

VII. An annual meeting shall be held in ——, when the members present shall vote such of their books as they may see fit into their standing library, and the remainder shall be sold for the benefit of the Society; and on this day the business shall commence with reading the rules of the Society; and on this day the business shall commence with reading the Rules of the Society, so that any alterations deemed necessary may be made therein; but no alterations may be made at any other meeting.

VIII. Any person wishing to become a member must be nominated by a member at one monthly meeting, and be balloted for at the next. The approbation of two-thirds to constitute an election. Each new member to pay the admission fee of 50 cents besides the annual subscription.

IX. A book shall be kept by the Secretary with the accounts of the Society, which shall be open to the inspection of the members at their meetings.

Let the above, with such modifications as may be thought best, be printed and posted, or written in a small book that will cost 25 cents or less. When a dozen have signed, let them have a meeting and organize at once. Above all, don't talk and talk about it, and say it would be a good thing—but *do it!* What would be the state of society and the world, were they made up of only that numerous class of men who ever have a *great mind to do so and so?*

INCORPORATIONS—MANUFACTORIES.

INCORPORATIONS OF CAPITALISTS—ESTABLISHMENT OF MANUFACTORIES: HOW AND WHEN BENEFICIAL TO AGRICULTURE.

SEEING in the *Marlboro' Gazette* that T. F. BOWIE, Esq., and others propose to establish, at the county town of that opulent county, Prince George's, a *Tobacco Manufactory*, leads us to remark that every man of candor will admit the benefits which must accrue to surrounding agricultural districts, from the establishment in their midst of prosperous factories when these are the spontaneous growth of suitable power and materials for carrying them on, and of a compensating demand for their fabrics.

Where congenial circumstances thus combine to attract capital and consumers to the doors of a farming community, how short-sighted, not to say stupid, is the legislative policy which throws clogs and difficulties in the way, such as the expense, delay, log-rolling and party calculations and maneuvering, and sometimes worse than all these, which attend an application to the Legislature for a special act of incorporation in every case; and the imposition of unreasonable and frightful responsibilities on capitalists who would risk a given amount of their means, in manufactories that would consume the produce of the soil, and in banks that would accommodate the farmer. Yet such has been, and still is, the short-sighted policy pursued in many of our States. Instead of holding out encouragement to capitalists who might be willing to associate for the purpose of loaning means to struggling and industrious farmers, and for giving activity to the natural advantages for manufacturing which may be found to exist in particular localities, the barbarous policy has been to prevent all such associations, by making those who form them individually liable, to the extent of their whole estate, for the debts of the company, so that in reward for their willingness to risk a part of their fortune to build up a new business, they are admonished by wise law-makers that if they dare do it, it will be at the peril of all the property they have in the world. Could any device be better calculated to banish capital beyond the sphere of such legislation, and along with it the skill that often only needs capital to put in operation the most useful establishments? How much wiser to pass some general law, as in Massachusetts and Rhode Island, under which it should be easy to form an association, either for banking or manufacturing purposes, leaving each member bound for the debts of the corporation only in proportion to his share of its capital and the corporation answerable only for the known and advertised amount of its stock—taking care that the state of its affairs be periodically and publicly exhibited. Exception might be made to the limited responsibility of the members in favor of debts due to operatives for work and labor performed, as it would be easy for the Directors to see that they were paid—daily, if need be.

Instead of thus opening widely the doors of each State, and each county in every State, for the attraction of capital and enterprise, and thus *destroying the "monopoly"* of the rich by distributing the capital among a great number of competing money and manufacturing institutions, it is too much the fashion to denounce all such associations, and to make laws for their incorporation difficult

to be had, complex in their provisions, and so hazardous to those who might accept them, that large capitals are left in the hands of the great shavers, and he who would invest his small earnings as in a savings-bank in his own neighborhood, under his own eyes, has no such resouree; while the moneyless man of knowledge and enterprise is driven into other States, where men and legislators have too much sagacity to bar the door against the access of capital and the skill and labor which are sure to follow the demand for them which capital creates.

But for clearer and more enlarged views of this part of the subject, we recommend the reader to turn back to pages 494–5 of our May number, to the luminous disquisition of a correspondent eminently conversant with such topics. Speaking there of the wise policy of Massachusetts and Rhode Island, and its effects on the agricultural interest and the general welfare of society throughout those States, he says: "The consequence is that there are *distributed throughout* those two States nearly two hundred money-shops, constantly engaged in the collection and distribution of capital owned by the people of the neighborhood, who themselves manage their own property, and are not compelled to transmit it to Boston, to be managed by others of whom they know but little. The general result is, that the trade in money is attended by little loss to those who deal with banks, and more uniform, steady and moderate profit to those who own them, than in *any other part of the world.* Throughout both States, every man is within the reach of a money-shop, and the industrious and prudent farmer, shopkeeper or mechanic, can at any time command small loans to aid him in his business. In no part of the world does capital distribute itself so equally—falling almost like the dew, and fertilizing where it falls; in none is there a currency so unexpensive, and in none is the quantity of currency so little liable to fluctuation."

Farmers and planters in Maryland and Virginia! will you not ponder these facts, and elect for your law-makers men who are capable of appreciating and acting upon them, instead of men too many of whom are mere drones without knowledge and without ambition or industry to seek for it—men intent only on setting party traps for their political opponents, until the time comes to fob their per diem, and go back to that life of inactivity from which they should never have emerged? How enviably different is the prosperous condition of the masses in Massachusetts and Rhode Island as here described, from that of States where usury laws prevail, and where every attempt to incorporate capital and industry for the more efficient use and exercise of both, is held up and denounced as an attempt to establish a despicable monopoly! Suppose an industrious young farmer, in any of these States, in coming to an exhausted farm, desires to buy and lay on a thousand bushels of lime, or to purchase economical, labor-saving and abundant implements and machinery, for which expenditure is true economy, he must either forego them and drag on, as with a broken back, the best years of his life, or he must first hunt up his "town endorser" and go begging to one of those mammoth banks with agricultural *titles*, which are concentrated in the great commercial emporiums, where the utmost accommodation to be had is the discount of a "sixty-day note," perhaps a few times renewable.

Then as to the "*profits of farming*" in that State where "the industrious and prudent farmer can command small loans to aid him in his business," look at the testimony given in at a meeting of the farmers of Massachusetts in the last number of this Journal. It elsewhere appears, too, in an authentic shape, that the

increase, per cent., of the wealth of Massachusetts from 1820 to 1840 was in no county less than 47·23, and the average increase in the whole State during that period 95·31 per cent., while the increase per cent. of population in the same period was 40·97. Our purpose, however, was not to enter on the barren task of gleaning after our enlightened correspondent C., who has left nothing to be gathered in this path; it was merely to suggest in view of this proposal to establish a tobacco manufactory at Upper Marlboro'. How much more advantageous for a State at large, to have capital *distributed*, where circumstances admit of it, and how much wiser to adopt a policy that will encourage such distribution over a wide surface and through every county, than to have the same amount of money capital and labor concentrated in large institutions and in but few places! Hence the satisfaction we always experience at learning that a number of factories, on a moderate scale, are springing up in different neighborhoods, which promise fair remuneration to the capital embarked in them. This, at a first and superficial view, may appear to conflict with the suggestion of a single central inspection for tobacco; but it does not in the least. The factory is a place where the people of the country exchange among themselves labor, provisions and money for the fabrics of the factory. The object of inspection is to enable the people—the consumers of Europe, and the people of the United States, the producers—to understand each other as to the value of the commodities to be exchanged with each other. That value must be fixed at the place in which they congregate—which is Baltimore—and no local decision as to quality and value will be of any avail. It will add to the costs and at last be abandoned again, as it has been before. Local inspections answered the purpose fifty years ago, before capital and purchasers were congregated in a large town—a congregation which time and necessity will always bring about, with its necessary consequences and public conveniences. The highlands and mountain ranges of Maryland, Virginia, the Carolinas, and Georgia, ought to abound in factories—so that the expense of transporting bulky articles, which now precludes their production, should be overcome by *condensing* them in form and value, by the power of machinery; nor do we doubt that the thousands of localities that now invite the use of skill and capital in these States would be occupied and speedily come into full play, creating life and activity where silence reigns profound, under more enlightened domestic legislation, and in the absence of that groveling and detestable *party* spirit in some of them, which, while it ever professes exclusive love for the people, contaminates and fly-blows every measure projected by enlightened patriotism for the solid and lasting good of the country.

And here, again, we hear the croaking voice of the wiseacre, who plumes himself on being, *par excellence*, "a *practical* man," putting in his caveat: "What," says he, "have Agricultural Journals and agricultural people to do with the laws and policy of the States? with incorporations to encourage industry, and to regulate the use of capital! Tell us only how to plant corn, and fatten hogs, and shear sheep." Ay, truly! and it is just this indifference to the laws of the land, as they relate to the landed interest, and to education, which has brought about that state of things under which the farmers of many States are themselves, by the classes that live on them, sheared more closely than their own sheep.

And where, then, says the reader—since you *will* have us *undergo the labor of thinking for ourselves*—where are we to find a cure for the enactment of laws and the establishment of a public policy so inimical to the rights and the prosperity of the plow? How are we to eradicate from our public councils that vul-

gar party spirit which, when analyzed, resolves itself into love of the flesh-pots—that Bohon Upas, which first appearing in the North, is spreading over the whole country, withering everything fair and fruitful within the reach of its baleful shadow? And to this we answer at once, that it is idle to dream of any substantial and progressive reform in the action of Governments, as that action bears upon and influences the landed interest, or even to expect any great and honorable (because intellectual) improvement in the field of practical husbandry, but by *enlightening the minds of the sons of farmers as they grow up*, in all that concerns not only the art of tillage but their political rights in relation to themselves and to other classes. Farmers! it is thus only that you can achieve a reform that shall reach the main springs of public prosperity. When thus you shall have raised the standard of general intelligence *among yourselves*, the intellectual and moral grade of your legislators will rise in proportion, until their sole ambition will be to vindicate and elevate the agricultural industry of the country, securing for it the benefit of all those reforms which Knowledge and Science never fail to achieve when applied to the melioration of every human pursuit. Above all things, learn to despise and scorn the fool or flatterer who would persuade you that *your* pursuit is either above or below the reach of being benefited by the lights of science—by thinking, by inquiry, by observation and comparison. With equal plausibility might the owner of an iron-mine bank be told that art can do nothing with the ore which it brings thence to be fashioned into your saw or your spade, your knife or your razor. Yet what has not inventive Science done to fashion things of so much usefulness and elegance out of such rude materials? For remember that without Science the mere physical strength of all the men in Maryland could not produce them, nor, but for machinery, could they be produced for their present cost a hundred times told.

But to come back more immediately to our subject: duty prompts us to add that great merit is to be accorded to those who take the lead in bringing manufactories into new and appropriate localities, creating on the spot a fair remunerating demand for the products of neighboring fields, gardens, dairies, &c. Such diffusion of capital and enterprise has, as before intimated, a tendency to break up the great monopolies enjoyed now by those only who reside in the immediate vicinity of large towns, where, under the centripetal influences adverted to, capital and consumers have a sort of legalized tendency to aggregate. It will, however, be observed that we have not ventured an opinion on the capabilities and fitness of Marlboro' for the particular manufactory in question, in reference either to the stockholders or the planters of the county. That must depend on various considerations, of which those concerned are far better qualified to judge than we pretend to be. The free and enlightened policy of the State of New-Jersey, in promoting the habit of association, and her exemption from taxes, are all drawing off or withholding wealth and population, rapidly and to a very large amount, from New-York and Pennsylvania.

This much we will venture to say in conclusion, that if the people of Massachusetts and Rhode Island could be lifted up, *en masse*, and set down in Maryland and Virginia, carrying with them their more liberal and sagacious policy in regard to the use and exercise of their money and enterprise, banks and manufactories would be seen to spring up in every county, and the whole of these old States, so long stationary or declining, though radically so much more fertile and more easily labored than those, would, before many years, possess four times as many people, and four times as much wealth as they do now.

In looking at the profits of farming in Massachusetts, be it remembered that those men have to deal with a rugged, hard, gravelly and stony soil, requiring for the plowman iron muscles for the slow and steady motion of the plow drawn by a span of oxen that seem to laugh as they walk away with 4,000 pounds in a loaded cart.

What we most desire is to see farmers come together as such, without respect to party, to consult about and to investigate their condition, and to see how it is that while the whole proceeds of the public lands, given by the old States for the common use and benefit of all the States of the American Union, are pledged for the payment of the interest on a war debt, and while the landed interest pays so many millions every year to the support of armies and navies, and army and navy schools, not *one dollar*—no, not one dollar—is given for instruction in *Agriculture or any industrial pursuit!* If money can be found to build and equip observatories and naval and military schools; if $80,000 can be found to print one Patent-Office Report, can nothing be had to found Agricultural Schools? But men who would have justice done themselves must show that they know *how to keep the account!* J. S. S.

CISTERNS:

HOW BUILT—THEIR COST, AND APPLICABILITY TO THE WANTS OF THE COUNTRY.

We the more earnestly desire to procure and disseminate all practical information on this subject, because we see so many people neglecting the means at hand everywhere for collecting an ample supply of pure water for all uses, which they might do from the roofs of their houses, by means of a simple cistern easily built after the fashion described in the following obliging communication from Mr. Buck. How many families in the country are scantily supplied with water for domestic uses, and that procured with great expense of labor. Moreover, no tongue can tell how much the domestic animals sometimes suffer for want of this first necessary of life!

J. S. Skinner, Esq. Hartford, Ct., April 1, 1847.

Dear Sir: Your favor asking information respecting the cistern you saw building at my place last summer, was duly received.

Failing to obtain from the builder that definite information I could wish, I will tell you all I know about this kind of cistern. Like everything else of Yankee invention, it is "patented;" the entry at the Patent-Office is, I understand, made by Obadiah Parker, of Syracuse, N. Y.

The cistern is built of cement, without brick or stone, say one-third cement, two-thirds coarse gravel mixed together like common mortar—the hole in the ground being dug large enough to admit of a wooden frame, made in pieces of two feet high by three feet long, the pieces being fastened to each other by hooks and staples; the frame is set off from the sides, say 2½ to 3 inches, according to the nature of the soil, commencing with one row of pieces: the composition (cement and gravel) is then turned in slowly, another set of pieces then hooken on, adding composition as before. As the composition hardens, the frames are removed, and it is finished inside with a trowel like the wall of a house. The top is arched, leaving a hole at top, say 24 inches square, to admit a person for the purpose of clearing it when necessary. The bottom is flat, and is made after the sides and top are finished.

For pipes for carrying the water in, and waste pipe, use a round stick, say 3 to 5 inches circumference, and form the composition around the stick, withdrawing the stick as the pipe is formed.

The cover to the hole on top of the cistern is generally of wood, in which you insert either wooden pump or lead pipe, though a lead pipe can be easily inserted

into any part of the cistern by boring a hole through the cement after it is thoroughly hardened.

The cost here is, for one of 40 bbls $25	The cost here is, for one of 75 bbls $40
.. .. 50 35	.. .. 100 50

This includes digging and materials.

The one you saw here was, say, 7 feet in depth, 6 feet diameter, and will hold 75 bbls.; it answers, in every respect, the purpose for which it is intended. It is covered with, say, 3 feet of dirt to protect it from frost, and loads of hay weighing a ton have passed over it this winter without causing it any injury. For dwelling-houses in the country about here, they have completely driven out of use the old-fashioned wooden cisterns. For convenience and additional protection against frost, they are generally built under the kitchen.

At the South, where they are not troubled with frost, there cannot be an objection to them. The person who built mine said he thought of going to Louisiana for that purpose next winter.

If in my power to obtain any farther information of this or any other matter in this neighborhood, please command the services of

Yours, truly, DANIEL BUCK, Jun.

CULTIVATION OF FLAX.

Sir: From the interest you take at all times in matters relating to Agriculture, I am induced to lay before you the result of an experiment in the cultivation of Flax on my father's farm, (the produce of which has just been sold by Mr. Schwann, agent for the sale of flax, Leeds,) with the hope that it may, in some degree, remove existing prejudices against the cultivation of this invaluable plant, as it not only supplies the farmer with an excellent ingredient for the purposes of feeding cattle, but also affords good and profitable employment to the rural population, which, it must be admitted by all, is much wanted at this season of the year.

It is by many considered an exhausting and unprofitable crop; the former is a mere idle notion; experience will teach that it *meliorates* rather than *exhausts* the soil (and it may not be out of place here to mention that this season, after a crop of flax, 1A. 0R. 1P. planted mangel-wurzel, produced, clean and free from tops, 43 tons 15 cwt.) With regard to the latter, I shall refer you to the following statement:

(GROWTH OF 1845 ON 4A. 1R. 24P.)	£	s.	d.
1,349 lbs. flax sold in Leeds for (after deducting all expenses)	25	10	6
106 lbs. of do. sold in Ensham	2	13	0
372 lbs. of tow, do	4	13	0
104 bushels of linseed, at 7s. 6d	39	0	0
Small quantity of tail linseed, chaff and refuse from scutching	1	10	0
Value of crop	73	6	6
Deduct expenses	40	15	3
Net profit	£32	11	3

EXPENSES.	£	s.	d.
Plowing 4A. 1R. 24P. at 10s.	2	4	0
10½ bushels linseed, at 7s. 6d	3	18	9
Sowing and harrowing do	0	10	0
Weeding	4	2	0
Pulling and tying up the stalks, threshing, spreading, turning and preparing for scutching, 30s. per acre	6	12	0
Expenses of carting, stacking in barn, &c.	1	15	0
Rent and taxes, 50s. per acre	11	0	0
Scutching 1,455 lbs. of flax, at 2d. per lb.	12	2	6
Do. 372 lbs. tow, at 1d. per lb.	1	11	0
Total expenses	40	15	3

It will be seen from the above statement that the cost of preparing the fibre for market is very great in comparison to its value, and I was induced from this serious item in the expenses to write to Mr. Warnes, of Trimingham, Norfolk, (to whom I am indebted for much useful information on the subject;) in answer to which he says, "The cost of dressing your flax is excessive, the quantity of tow and consequent waste immense." I think, therefore, under these circumstances, and with the above result, the cultivation of flax is deserving of some consideration.

My only object in troubling you with this subject is the improvement of Agriculture.

I remain, Sir, yours very respectfully, SAMUEL DRUCE, Jun.

Ensham, Jan. 27, 1847. [Oxford (Eng.) Journal.

☞ A drop or two of honey well rubbed on the hands while wet, after washing with soap, prevents chapping, and removes the roughness of the skin; it is particularly pleasant for children's hands and faces in cold weather.

AGRICULTURE IN SCOTLAND.

Those who believe that there is nothing to be learned out of our own country, because England is, for the most part, enveloped in fog, and because there the cattle feed on turnips, and in Scotland the men eat oatmeal stir-about, need not read the following; but those may who believe it useful to know what is deemed and uniformly obtained as "a good average crop" to the acre, in, perhaps, the best cultivated region in the world. The words in Italics were not so in the London Monthly Magazine (for April) from which we take this communication. Those lines were underscored by us to show their correspondence with what we have been insisting on, and in which we have again and again implored the aid of the general press of our country.

For our part, we are tired of reading accounts of big crops and fat hogs and bullocks, from year to year, but neither bigger nor fatter than we have had them for thirty years. Let all unite in procuring for those who are to be agriculturists an *education* which shall reveal to them the *principles*, the knowledge of which will substitute in their pursuit uniform success for accidental results. In the practice of Agriculture, as in the practice of medicine, let us aim to have our sons become physicians instead of being quacks. In sickness both may be attentive—both may be kind; but which would we soonest call in, in case of serious illness? Ignorant men often think themselves the wisest, and those who are too lazy to seek knowledge would dissuade others, as the fox who lost his tail in the trap would persuade his companions that nothing was so convenient and comely as a *short tail.*

If agricultural education through the country were as thorough as military education is at West Point—and half the expenditure for our army in time of peace would make it so—Maryland and Virginia might be made, like the Lothians in Scotland, to average 40 bushels of wheat, 56 of barley and 80 of oats, to the acre. Why should they not?

To the Editor of the Western Times:

Sir: A few weeks since I troubled you with an account of the method adopted in the southern counties of Scotland, of paying farm-laborers, &c.; therefore have again taken the liberty of trespassing on your valuable columns, by giving your agricultural readers some idea of the manner in which farming operations are conducted in the Lothians of Scotland or Counties of Haddington, Edinburgh and Linlithgow. I shall not enter minutely into details; those who wish to be more fully acquainted with Scotch farming should visit the country; and whether they do so on a tour of profit or amusement, they will be most amply repaid.

The Lothian farms consist each of from 200 to 500 Scotch acres, the Scotch acre being one-fourth larger than the English statute acre, therefore I shall limit my remarks to the current acre of the Lothians. A farm of 300 to 500 acres is by common consent the utmost which one farmer is thought capable of managing. The farm-buildings are small, compact, and situated near the center of the farm, and have always a steam-engine of six or eight horse power for threshing and other purposes. At the entrance of the farm-yard is the dwelling of the grieve, or bailiff—for every farmer keeps a bailiff, who superintends everything on the farm, and is cognizant of everything that goes in or out of the farm-buildings. I found the grieves universally clever, acute and sensible, and their minds open to what was passing in the world beyond the limits of their own immediate neighborhood; this speaks well of *what education has done for the peasantry of this part of Scotland.* The farmers themselves are men of much superior education, manners and style of living to the possibly equally wealthy ones of the farming counties of England; they are all of most hospitable habits. Few of them are without a handsome phaeton for the use of the female members of their family. One feature throughout

the Lothian farms may be remarked—*a great uniformity in the quality of the crops.* Not, as elsewhere, here a good farmer and there a bad one, here a failing crop and there a middling one, and here again a finer one—but nearly all the same—*showing that farming is there reduced to a science, leaving nothing uncertain but the Seasons.* The farms are divided into fields of from 20 to 50 acres each, the hedges are clipped low and thin, and the ditches covered in, so as to occupy as little space as possible. There are no trees in the hedge-rows, and few furrows in the land; and thus, between one thing and another, the entire area of the farm is made productive, and the expense of fences and gates is reduced to a minimum. Another thing worth noting is, that permanent grass, either as meadow or pasture, is unknown, or nearly so; the only hay or pasture is derived from artificial grass sown in the regular rotation of crops. The *rent* of the Lothian farms is from £3 10s. to £7 per acre, [$17 50 to $35!] and these high rents the farmers not only pay *but thrive upon.* They are enabled to pay these rents and thrive, partly *by the heavy crops arising from skillful cultivation,* and partly by *economy of management* in every department. Actual wages, however, are as high as in England, viz: 10s. to 11s. [$2 20 to $2 42] a week for a common laborer, 12s. for a plowman, and 9d. a day for women—ten hours to the day. As to the great amount of produce, it must be remembered that *all the land is under the plow.* Five quarters of wheat [40], ten of oats [80], seven of barley [56], and from thirty to thirty-five tons of turnips, are reckoned a good average to the acre.

Economy of management is shown in the division of employment confining the attention of the farmer to as few points as possible, in a due rotation of crops, so as to have no land lying idle or unproductive, and in the use of machines and horses instead of manual labor, whenever circumstances admit of it.

All the Lothian farms are held on 19 years' leases, and the rents wholly or partly corn-rents, rising and falling with the yearly fluctuations of the price of corn. Without a long lease the farmers would not lay out their capital in the free manner they now do, and with a long lease they feel independent of their landlords, more as if they were the actual proprietors. In consequence of this independence and part ownership, as it were, of their farms, men of much superior rank, education and capital engage in the business of farming than is the case in England, or, indeed, *than ever will be the case* in England under existing circumstances.

The foundation of all improvements in the Scotch farming is the system of *thorough draining;* and so essential is this considered that most of the land is deemed unworthy of being farmed at all until it has undergone this operation. The drains are made at regular distances, from 15 to 30 feet or more apart, according to the nature of the soil, and from 24 to 30 inches deep. The general course of cropping in the Lothians is: wheat after summer fallow; turnip, barley, seeds down for one, two or three years, as circumstances vary; oats. When the land is very stiff a crop of beans and peas is taken.

I have thus endeavored to give, in a somewhat unconnected way, the results of my observations on the Lothian farming, where high rents, high profits, and a well paid and contented peasantry are all seen combined in a pleasing union. It is an interesting question, but one I am not going to enter upon, how this improved system of cultivation can be introduced into England? I am inclined to think the *superior and more practical education of the Scotch has been at the bottom of the improved state of things. Education has given the knowledge which has enabled them to apply their capital with success,* and to extract from the land-owner the long lease, which enables them to invest their capital with safety as well as success. Trusting these few remarks will be found worthy a place in your paper, Believe me, truly yours,

Broadclist, Feb. 17, 1847. R. S. HEWS.

POTASH WASH FOR FRUIT TREES.—It being about time to attend to that work, I shall describe my method of using the potash. I usually dissolve ten pounds in two pails of hot water, and for young trees I put a quart of that to a pail of cold water, and when well mixed apply it to the trunks and limbs of the trees, either with a whitewash brush or a broom, and for old trees I put two quarts to a pail of cold water, and put it on as far as I can reach. If any moss or other vegetable substance adheres to the limbs, I take a ladder, by which means I can reach and wash the branches wherever the moss is; or if any lice or scales get on my trees, I wash to the extreme ends of the branches, for no tree can be healthy if it have lice. If the tree is well washed it will remove moss, lice, scales, and all of the thick bark that often adheres to large trees, which are a harbor or a hiding-place for insects to deposit their eggs, and for the borer to escape from birds.

I wash all kinds of trees, and think myself well paid for it. Last year I did so, and was not troubled with the fruit falling off, nor having it ruined by worms. My neighbors, Emerson and Thayer, washed their trees, and were equally successful. I usually do it in February and March, but it may be done in December and January if the weather is warm, or in April, if it is not convenient to do it before. The potash that runs down the trunk is not lost; it nourishes the tree, and keeps off borers. I deem it almost indispensable to the raising of good fruit to wash the trees well. [New-England Farmer.

NETTING FOR SHEEP-FOLDS.—Messrs. Wildey & Co., of Holland-street, Blackfriar's Road, obtained a prize for this "netting," made of the bark of cocoanut, at the Royal Agricultural Society's meeting, at Bristol, in 1842. It is also strongly recommended in the Society's Report of that year. It will wear out several sets of tarred hemp netting, and is so light that a herdsman can with ease carry 200 yards of it.

THE VALUE OF TIME.

Steamboat Mary Washington, RAPPAHANNOCK, June 13, 1847.

Mr. Editor: The size and scope of your journal enable you to spread before your readers a variety of matter over and above the description of new implements and processes employed in practical Agriculture, and the results of such experiments as accident may hit upon, or science suggest. You have well judged, Sir, that the mind, like the palate, calls for some variety, and having myself been often gratified by the perusal in THE FARMERS' LIBRARY of things not strictly practical, will, with your permission, endeavor to contribute occasionally to that diversity in which I have myself found such agreeable amusement. As a longer preface would ill comport with the reflections which prompted what I am about now to say, let me at once declare that in my judgment there are few topics on which men who live in the country, and more especially those who most complain of "hard times," stand more in need of some words of exhortation and reproof than on their insensibility to THE PRECIOUS VALUE OF TIME. When, Mr. Editor, you come to reflect on the shortness of the average period of human life, and how every man of proper feeling must desire not merely to maintain his own independence, but to provide for his family that blessing without which there can be no security for virtue itself; and then when you consider how large a portion of existence, even in a condition of ease and health, must necessarily be consumed in repairing the natural wear and tear of the constitution, is it not amazing to think how many hours and days, amounting in the aggregate to years, are thrown away, more especially, perhaps it may be said, in the country than in cities, not merely in listlessness, but in hanging about country taverns and stores, and in the low and vulgar squabbles and intrigues that consume the time of *party politicians?* Reflecting on this subject, it occurred to me, strange as it may appear, that there is no example to which these gentlemen of the country ever pressed with difficulties, may be referred, with more hope of good effect, than to the invariable, untiring habits of systematic application to business which characterize men of the *largest fortunes in our largest cities*, where time is measured by the second, as gold is weighed by the grain. How different with many, even among those who are esteemed the most industrious farmers. With them, when meeting on the road, so inveterate is the custom of halting to while away precious time in common-place inquiries and remarks, that even their horses, partaking, as if by mesmeric influence the social temper and indolent habits of their riders, mutually slacken their pace as they approach each other, and seem, like them, to exchange their social salutations. After half an hour passed in stereotype inquiries about the health of family and neighbors, and remarks about the weather, the prevalence of the drouth, the ravages of the fly, the bloody details and glories of the war, &c., they at last separate, and proceeding each perhaps a mile farther on his way, they both meet another neighbor, and after the usual inquiries the leg is thrown over the pommel of the saddle, and, discussing the "hardness of the times," another half hour is swallowed up in the great abyss of more precious time forever and irretrievably lost. Hence it was, as I remember, Mr. Editor, that my lamented father, in sending me, when a boy, on a journey of business, used to tell me, at parting, to remember, that in nothing could *industry* be practiced with more effect than in *traveling*. In this consists the moral of Esop's fable of the *Hare and the Tortoise*. But go from the country to the large town, (not the country village,) where country people are apt to think most men live in ease and idleness, and you will find every man on the run, and the wealthiest generally the most impatient of the loss of a moment; so much do they dread it that in the streets they neither look to the right nor the left, for fear of deadening their way by even a nod of recognition to their most intimate friend from the country. A case which fell under my own observation, and to which I was in fact a party, may serve to show to your readers in the country what sort of men are these

town *millionaires*, with whom we are apt to associate no ideas but of the most luxurious indulgence and the most ostentatious displays of superfluous wealth.

Having occasion, some weeks since, to remit nearly $30,000 to Paris, and being without experience as to the minutiæ of the mercantile process, I put myself under the direction of a friend to guide me through what I considered quite an important operation. Accordingly, under his instruction, I got from the bank clerk a pencil memorandum of the amount to be remitted, on a paper as large as your thumb-nail. Thus provided, we proceeded a few doors below, in Wall-street, to the office of the celebrated house of P. W. & Co., where, instead of finding a starched dignitary in his silk gown and worked slippers, reposing in his velvet arm-chair, difficult of access and supercilious in his demeanor, I came plump upon the head of the house, standing at his desk like one of his clerks, and evidently quite as hard at work as any among them. On my name being mentioned, in place of stopping to shake hands, and asking me to be seated, and inquiring when I came to town, and how were all at home, and remarking on the news and the weather as I, good easy soul, had imagined he would, in the way of a long preface to a great piece of business, this Wall-street millionaire regarded me with an air of courteous affability, but at the same time with an unmistakable desire to learn and to dispatch my affair, whatever it might be, *without any useless palaver*; so, holding up my bank memorandum, I told him I wanted him to put me in the way of remitting that amount to my friend in Paris. In an instant, with one hand he took the paper, and saying only "three fifty, Sir," with the forefinger of the other, he beckoned a clerk to him, and handing him the *mem.*, he told him to prepare the bills of exchange; then, casting his eyes on a clock in full view, he pointed to it, and said to me, "Call at 12, Sir, if you please," and straightway he *turned to his work!* What "three-and-a-half" meant this deponent did not know; but doubted not that all would be O. K., and not choosing to betray his ignorance of what any fool on 'Change was supposed to understand, he went his way, and true to the appointment, called again at 12, with an "endorsed check from the bank for, as before said, something short of $30,000. Here again the ceremony was brief, and the dialogue as sententious as nautical language in a storm at sea. On reëntering I handed him the check, whereupon he again called the same clerk, signed the three bills of exchange on Hottinguer & Co., Paris, in the twinkling of an eye, handed them over with practiced suavity of manner, and—*again turned back to his work.* In this "business transaction of tens of thousands, there were not a dozen words spoken, nor more than one minute consumed; and such are the habits of application and dispatch, day in and day out, throughout the year, with these men of enormous fortunes in our large towns. The punctuality and industry which take their root in the early struggles for independence, continue through life; while in the country, if one farmer call on another to buy or sell a cow, or a few barrels of corn, the chance is that the bargain will not be struck until after he has been persuaded to "dinner," if not to supper, though everything on his farm is the worse for his absence—that is, if he be on it a man of intelligence and industry, such as every farmer should aspire to be. Finally, sir, let me ask you whether the best guaranty for profitable employment of such leisure moments as can be gained in the country, be not in a *love of books*, and of such reading as you give us in THE FARMERS' LIBRARY? *

N. B.—These thoughts have been committed to paper while we are steaming up the Rappahannock River, 120 miles in length, winding its way to the Chesapeake through a district of Old Virginia famed in olden time for hospitality and high living—for the excellent management of its housewives and the beauty of their daughters—for cock-fighting, fox-hunting, horse-racing—in a word, for fun and frolic, as for talents, gallantry and patriotism. Should you ever be going to any of the Virginia Springs, I recommend you to take the delightful "*Mary Washington*" steamer, *Capt. Myers*, at Baltimore, at 4 P. M., on any Saturday, At daylight next morning you enter the Rappahannock, and, arriving at Fredericksburgh before night, you will have passed in view of what remains of the

[* All that we can say to the remark of our correspondent is, that we endeavor assiduously to make up each number of such matter as ought to be placed in the hands of every young man in the country. *Ed. Farm. Lib.*]

old celebrated Mount Airy, and many of the old family seats of the Tayloes, the Carters, the Bernards, &c., so distinguished for their ample dimensions, the elegance of their hospitality, and the completeness of all their appointments. How large must have been the fortunes, how sterling the virtues, of those who have transmitted affluence and good names, even to the third and fourth generations! Education, sagacity, honorable prudence and attention to modern improvements in Agriculture, have, however, done much to resist in this region, among some families, the effect of often recurring division and subdivision of estates. Much is it to be desired that such conservative influences were of more universal prevalence. OMOO.

THE SIX BEST APPLES FOR THE CLIMATE OF BOSTON.

THE following remarks are made by B. V. FRENCH, and we take them from Downing's Horticulturist. The Editor says the writer "is acknowledged to be the best cultivator of the Apple in the neighborhood of Boston. The selection he recommends is based entirely on his own practical observations; and we believe he cultivates in the orchards on his estate at Braintree, a larger collection than any amateur in Massachusetts."

To a person whose grounds are limited, and who must, of course, restrict his variety accordingly, it is important that he should made his choice understandingly and most advantageously. It may be that the best six varieties in the vicinity of Boston may not prove the very best in that of Philadelphia. [Farmer's Cabinet.

IN recommending the six best apples for New-England culture, I must, of course, be understood to be confined to this number of trees. Where a larger space and greater variety is permitted, several varieties of high merit would certainly be added. In selecting so small a number, you will understand me to bear in mind such qualities of regular productiveness, fair habit of growth and adaptation to our climate, as make a given variety a constant favorite with the cultivator.

I have also kept in view a succession of fruit for the table and kitchen, so as to serve as a continual supply from Midsummer till the succeeding spring.

1st. *Early Harvest.*—For the best early apple worth cultivating, I should name the Early Harvest. The tree, with me, is a free grower, healthy, a profuse bearer, and the fruit hangs well. It ripens the last of July. The fruit is of medium size, roundish, rather flat, and if used when not quite ripe, it is one of the most excellent for pies, tarts, and cooking generally; and when fully ripened on the trees it becomes of a fine, rich yellow, and ranks high as a table fruit.

2d. *The Porter.*—In succession this excellent fruit follows the Early Harvest; it is also a free growing tree, and a great bearer. The fruit is conical-oblong, yellow; the skin is beautifully smooth and fair, and when fully ripened in the sun, has a fine blush. It is excellent for the table or for cooking, and if properly taken care of, will keep from the time of its ripening, early in September, till the middle of October. The many good qualities of this native fruit have made it one of our greatest favorites.

3d. *Fameuse.**—I know of no apple to take the place of the Fameuse for the table at this season. It is in eating from the middle of October, and with care continues so till February. The tree, with me, is small in size, and a medium bearer; the fruit is of medium size, flat; the skin is red, smooth, and takes a high polish; the flesh is very white, juicy and, I think, in flavor, excels all others for table use, from the time the Porter is gone till the Rhode Island Greening comes into use.

4th. *The Rhode Island Greening.*—The tree is a strong, hardy and free grower, and a great bearer. The fruit is flattened, of a yellowish green, with a dull blush. The flesh is tender, juicy, and of fine flavor for cooking or the table. This fruit is in use from September till February, and is fine for the table in November and December. It is too well known and esteemed to need any description of mine, having a prominent place in every good orchard.

5th. *White Seeknofurther.*—This excellent fruit, I am informed, originated in the garden of the late William Prince, Esq., of Flushing. In point of fine flavor, it excels all other apples that I have eaten. The tree is of medium growth, of a leaning habit, a full bearer every other year. The fruit is rather oblong, greenish with dark spots; and is not a very fair or sightly fruit. Its season is January and February. Its flesh is very juicy, tender, and fine flavored. This variety is not much known in New-England; in fact, I know of but three bearing trees.

6th. *Baldwin.*—This, our most popular New-England apple, is the universal favorite as a late winter fruit. Its hardy, healthy habit as a tree, and the heavy and regular crops it bears, together with its fine flavor, render it indispensable here in every orchard.

Mr. FRENCH has, we know, devoted his attention to fruits with a zeal equaled only by his taste and intelligence. We look upon and feel bound to hold up such men as he and

* Or *Pomme de Neige*, London Hort. Soc. Cat., and Downing's Fruit and Fruit Trees.

Mr. WILDER, the President of the Horticultural Society of Massachusetts, as worthy of all honor and esteem among those who would discriminate between men who distinguish themselves in the peaceful, useful, and elegant pursuits of Agriculture and Horticulture, rather than in schemes of mere money-making, or in fields of blood.

It is with portraits and memoirs of such men as these that we should delight to ornament and enrich the pages of the FARMERS' LIBRARY.

LONG PREFACES.

Mr. Editor: I wish you could persuade all writers for the public to come *at once to the point.* In our country nothing is so precious as *time.* Do you not often meet with essays in which the pith of the matter is to the preface like a tail to a kite, reminding you of those bad nuts that have an immensely thick hull, and a very small, though it may be rich, kernel? In the British American Cultivator before me is an article of a column and a half on "*Saving Horses from Fire,*" the whole gist of which is—

"I recommend first, to *blind* the animal *thoroughly,* and second, to unloose or cut the halter, and the terrified animal will, *with kind and gentle usage,* at once suffer himself to be led past, nay, even *through* the raging element. I have myself been benefited by possessing the knowledge of this plan, and have satisfactorily and practically put it to the test, after all other means that could be thought of—both gentle, persuasive and compulsory—had been tried in vain."

☞ Mr. RANDALL's interesting Letters on 'SHEEP HUSBANDRY IN THE SOUTH' will be continued in our next.

PRICES CURRENT.

[*Corrected, June 23, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	4 75	@ 4 87½
Pearls, 1st sort, '46		5 87½	@ — —
BEESWAX—American Yellow		— 24	@ — 25
CANDLES—Mould, Tallow	℔ lb.	— 10½	@ — 12
Sperm		— 30	@ — 31
COTTON—From	℔ lb.	— 10½	@ — 14
COTTON BAGGING—American		— 13	@ — —
CORDAGE—American	℔ lb.	— 11	@ — 12
DOMESTIC GOODS—Shirtings,	℔ y.	— 5	@ — 11
Sheetings		— 6½	@ — 15
FEATHERS—American, live		— 28	@ — 33
FLAX—American		— 8	@ — 9
FLOUR & MEAL—Genesee,	℔ bbl.	7 37½	@ — —
Troy		— —	@ — —
Michigan		7 12½	@ 7 25
Ohio, Flat Hoop		7 12½	@ 7 25
Ohio, Round Hoop		— —	@ — —
Ohio, via New-Orleans		— —	@ — —
Pennsylvania		— —	@ — —
Brandywine		— —	@ — —
Georgetown		7 75	@ — —
Baltimore City Mills		— —	@ — —
Richmond City Mills		— —	@ — —
Richmond Country		— —	@ — —
Alexandria, Petersburg, &c		— —	@ — —
Rye Flour		6 —	@ — —
Corn Meal, Western and Jersey		4 75	@ 5 —
Corn Meal, Brandywine	hhd.	5 25	@ 5 37½
GRAIN—Wheat, White	℔ bush.	1 85	@ 1 87½
Wheat, Red and mixed		1 60	@ 1 70
Rye, Northern		1 10	@ — —
Corn, Jersey and Northern yel		— 98	@ 1 —
Corn, Southern, yellow		— 93	@ — 95
Corn, Southern	(weight)	— —	@ — —
Oats, River and Canal		— 55	@ — 56
Oats, Jersey		— —	@ — —
HAY—North River in bales,	℔ 100 lb.	— 50	@ — 55
HEMP—American, dew-rotted	ton	100	@ 110 —
" " water-rotted		175	@ 200 —
HOPS—1st sort 1846		— 9	@ — 12
IRON—American Pig, No 1		— —	@ 32 50
" Common		22 50	@ 25 —
LIME—Thomaston	℔ bbl.	— 80	@ — —
LUMBER—Boards, N.R.,	℔ M. ft. clr.	30 —	@ 35 —
Boards, Eastern Pine		— —	@ — —
Boards, Albany Pine	℔ pce.	— 10	@ — 18
Plank, Georgia Y. Pine.	℔ M. ft.	27 50	@ — —
Staves, White Oak, pipe.	℔ M.	50 —	@ — —
Staves, White Oak, hhd		40 —	@ — —
Staves, White Oak, bbl		30 —	@ — —
Staves, Red Oak, hhd		24 —	@ 28 —
Hoops		20 —	@ 30 —
Scantling, Eastern		— —	@ — —
Scantling, Oak		— —	@ — —
Timber, Oak	℔ cubic foot	— 20	@ — 30
Timber, White Pine		— 13	@ — 20
Timber, Georgia Yellow Pine		— 24	@ — 28
Shingles	℔ bunch	1 50	@ 1 60
Shingles, Cedar, 3 feet, 1st quality		26 —	@ — —
Shingles, Cedar, 3 feet, 2d quality		22 —	@ 24 —
Shingles, Cedar, 2 feet, 1st quality		17 —	@ 18 —
Shingles, Cedar, 2 feet, 2d quality		15 —	@ 16 —
Shingles, Cypress, 2 feet		13 —	@ 14 —
Shingles, Company		28 —	@ 30 —
MUSTARD—American		— —	@ — —
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@ — 14
Cut 4d to 40d		— 4¼	@ — 4¾
PLASTER PARIS—	℔ ton	2 25	@ — —
PROVISIONS—Beef, Mess,	℔ bbl.	13 50	@ 14 —
Beef, Prime		9 25	@ 9 50
Pork, Mess, Ohio, new		16 25	@ 16 37½
Pork, Prime, Ohio, new		13 —	@ — —
Lard, Ohio	℔ lb.	— 9½	@ — 10½
Hams, Pickled		— 7¾	@ — 8¾
Shoulders, Pickled		— 6½	@ — 6¾
Sides, Pickled		— —	@ — —
Beef, Smoked	℔ lb.	— 12	@ — —
Butter, Orange County Dairy		— 18¾	@ — —
Butter, Western Dairy		— 13	@ — 15
Butter, Grease		— —	@ — —
Cheese, in casks and boxes		— 6	@ — 7½
SEEDS—Clover	℔ lb.	— 6½	@ — 7
Timothy	℔ tierce	13 —	@ 18 —
Flax, Rough		9 25	@ 9 50
SOAP—N. York, Brown	℔ lb.	— 3½	@ — 5¼
TALLOW—American Rendered		— 8½	@ — 9
TOBACCO—Virginia	@ lb.	— 2½	@ — 7¾
North Carolina		— —	@ — —
Kentucky and Missouri		— 3	@ — 7¼
WOOL—Am. Saxony, Fleece,	℔ lb.	— 40	@ — 45
American Full Blood Merino		— 35	@ — 38
American ½ and ¾ Merino		— 28	@ — 32
American Native and ¼ Merino		— 25	@ — 27
Superfine, Pulled Country		— 30	@ — 31

MONTHLY

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REMARKS ON THINGS IN GENERAL.....No I.

BY A RAMBLER IN THE MOUNTAINS OF VIRGINIA,

With Notes by the Editor of The Farmers' Library, to whom they were addressed.

Had your Journal been restricted in its plan to the mere suggestion of experiments and of rotations in practical Agriculture, infinitely varied as these may be, according to the whim or theory of the husbandman, and to the naked statement of actual results as they turn up in the field, it would not have been practicable to maintain for it that novelty by which attention must be kept alive, or to give that value to its contents which fresh and useful facts and information only can impart, in the minds of discriminating and sensible readers. But by opening, as you have done, the wider field of agricultural economy and statistics, and inviting your readers and correspondents to explore and illustrate the great volume of Nature itself, as it is connected with the labors and wants of the agriculturist, an inexhaustible store of matter for speculation and improvement has been secured, suited to the taste and wants of all classes and conditions. With a choice of subjects, from that variety which every phase of the country presents, is it not easy for every one to contribute something to its pages? and is there not a sort of moral obligation resting on all, to reciprocate the favors of those who submit for common benefit the results of their reflections and experience? Preferring always to illustrate my meaning by analogies drawn from rural life, let me ask, what would be thought of the churl who would borrow his neighbor's hammer, and yet refuse to lend him his saw? In acknowledgment, then, of this duty, as one of your constant readers, I shall send you notes and observations connected with the agricultural condition and prospects of the regions over which my summer rambles may lead me; interspersed with appropriate extracts from books as companions, with which experience has taught me never to fail in provining myself on such occasions; and now, Sir, having introduced myself and my design, *allons*—as they say in France—let us proceed. And first, as we are speaking of books, though it may not seem to be very germain to the matter of Agriculture, let us say a word about

BOOKSELLERS AND PRINTING OFFICES IN NEW-YORK AND ELSEWHERE.

A full exhibit of printing statistics in that great Emporium, would show that in no department of human industry has modern progress been more wonderful than in this. Nothing has in fact more engaged the inventive faculties of our countrymen than improvements in the *printing press*—as the great instrument for generating and diffusing knowledge: the very passion of our age, and one that while it feeds itself grows more insatiate and vigorous by indulgence. The most ingenious mechanical contrivances, propelled by the vehement power of steam itself, have been put in requisition to multiply its energies, and to enable it to supply fresh materials to satisfy the voracity of the public demand for intellectual excitement;

until, nowadays, no morning opens that does not overspread the counters of New York booksellers with new tracts and volumes—some heavy as lead, some lighter than chaff itself—and when to these are added the myriads of daily impressions of miniature and mammoth newspapers, one is at a loss to guess where lies that world of rags in which the paper-makers find their materials, and yet more the wonder is, where time and readers can be found for such a world of printed thought!

A full exposition of this branch of business would amaze the public, and is needed in exhibition of our industrial statistics. The conductors of "*Chambers's Edinburgh Journal*," and other publications of great note and value, turn out from their machines annually, as we are told, ten millions of sheets, each sheet being a book of its kind; and theirs is but "a fragment of the modern trade in literature." It would be curious to learn what is done in the same way annually by the Harpers, Appletons, Wiley & Putnam, Burgess & Stringer, Graham and others in New-York, and by Lea & Blanchard, and Carey & Hart, Philadelphia. But, Sir, is it not to be apprehended that the supply is overrunning the consumption, especially of the cheap literature—that its circulation is too exclusively confined to city populations; and that some new and more adequate faculties need to be contrived and systematized, for *distributing* the surplus over the land, as it were, and forcing it on the attention and enjoyment of the masses in smaller towns and in the country generally? It takes a disciple of Izaak Walton, like WEBSTER, to catch and cook a fish, but any lazy hulk will eat his chowder when it is *put before him.*

Under the title of *booksellers*, there is a chapter in the Edinburgh Journal for March last, which, if it has not attracted, I would fain recommend to, the notice of all our large houses in the "trade." And here be it said, *en passant*, that were honors and rewards bestowed in this world in proportion to the real benefits which men confer on their kind, these brothers—Harpers of your City, and W. & R. Chambers of Edinburgh—deserve to rank your mere military heroes; for while these run you through the body, *secundem artem*, in the name of "God and Liberty," those are subduing realms of ignorance and barbarism with the two-edged sword of Knowledge and Virtue; shedding a light that gives verdure and vigor where darkness had hitherto etiolated the minds of the masses. In thus referring to military heroes, be it always understood that no allusion is to be implied to *him* who was "first in war, first in peace, and first in the hearts of his countrymen;" for his warlike achievements are esteemed by the world as altogether subordinate to his *civil virtues.*

In the chapter referred to, is a brief sketch of the revolution which has occurred of late years in the system of book printing and selling, which leads the editors to recommend corresponding measures with a view to render this cheaper production available to the far greater extent of which they are satisfied it is susceptible.

"The only sure way," say these men of vast experience, is "to act aggressively on the masses. Take the bookseller's shop to their doors and firesides, and let them see and handle what is going on in the department of Literature specially addressed to them. There appear to be only two ways, say they, by which the thing could be feasibly attempted. One would consist in country booksellers greatly altering the style of their operations. Instead of laying a parcel of new tracts or cheap popular books on their own counters, and then letting them take their chance, they might either proceed themselves or send persons in their employment to call on all parties around, likely to become purchasers. If well worked, such a system would carry literature into every neighborhood, and probably extend the sale of cheap and useful books immensely; and it would have the advantage of being carried out at scarcely any expense.

"Should provincial booksellers find it inconvenient or impracticable to institute any such process, then another distributive enginery might be attempted. Small shopkeepers in the country, or in densely populated neighborhoods, might safely and profitably adventure in the trade of selling cheap and popular tracts, and so might individuals out of employment take up the business of hawking articles of this kind. A number of instances have come under our knowledge of parties formerly in wretchedness making a good livelihood by this easily-conducted trade; while at the same time they greatly extended the taste for popular litera-

ture. In a large town, where the sale of our journal could not by the usual means be raised above fifty copies, an enterprising individual, stepping beyond the bounds of the 'trade,' elevated it with ease to twelve hundred copies. In another but much larger town the sales of our publications generally have been latterly doubled, merely by a bookseller in the place having incited a few men in poor circumstances to become peripatetic dealers. These and other circumstances convince us that the process of *distributing* literature has fallen considerably behind the age, and admits of prodigious extension through the agency of a new class of tradesmen acting aggressively on the masses."

The editors of the "Journal" proceed to give instances of young men in needful circumstances, who have commenced on the smallest scale, and who have risen to be respectable stationary booksellers, and who have in turn given a start to other young men in the same way. Might not thousands find employment in this way in our own country, who, after wasting years in idleness, getting sad and sick with "hope deferred," at last give themselves up to despair and dissipation, or finally enlist as common soldiers, and perish, at home or abroad, with the rum or the yellow fever. Take your publication, Mr. Editor, for example, which ought to be read by every farmer and every farmer's son in this Union: the publishers sell it to the trade at a discount that would enable any peripatetic vender to pocket more than one dollar for every hundred. Now how many young men might at least make an honest livelihood for the nonce, and see the country at the same time, by combining the sale of THE FARMERS' LIBRARY with that of other publications.* But I should not have troubled you with this extract, were it not certain that you regard it as the bounden duty of every paper devoted especially to the agricultural interest to suggest every means that may appear feasible for distributing knowledge more diffusively through the masses, seeing how much the public liberty depends on universal enlightenment where suffrage is so universal. But to this end there is first need of a great

REFORM IN OUR SYSTEMS OF EDUCATION.

To accomplish this, our leading men of influence in society must be awakened to its importance. We must have *capable and conscientious committees of education in our Legislatures*, to take the subject to heart. Parents must be shamed, if they cannot otherwise be made sensible of their scandalous neglect of the mind and character of their own offspring. The press must enlighten and animate public sentiment. Congress must be forced to make provision to enable each State to rear up qualified instructors.† In vain shall a few enterprising booksellers, wielding the infinitely-multiplied powers of the press and facilities of publication, provide cheap literature for a *totally uneducated people!* The seed must not be scattered on the way-side, to spring up amid thorns and brambles;

[* Will the friends of the work please suggest this to any honest young man who is in need of employment, and would like to undertake it? *To all such young men* of integrity the publishers will supply or send six copies to any address they may designate, for $20—to enable them to make the experiment. *Ed. Farm. Lib.*]

[† The Representatives of the landed interest will be grossly derelict in their duty, and will deserve to be repudiated by their constituents until they shall have done this. See what they are doing, and wisely doing—if we must have wars—to insure greater skill and efficiency in all operations by the cannon and the sword; and would not the application of Science, provided for in like manner by the General Government, do as much for the more beneficent operations of the plow? The British Government is turning out annually 300 instructed civil teachers for Ireland: ought a republican people—propagating its principles by the sword, and inculcating hatred of monarchies—to allow them to outdo it in providing for the education of the people? Talk of Internal Improvements! The best sort of internal improvements would be to give, out of the public lands or otherwise, to each State, the means of educating teachers for schools of instruction of farmers' sons, in that which constitutes the civil part of the course at West Point—Bridge-building, Road-making, Mineralogy, Chemistry, Botany, &c.—and this is what the landed interest would soon accomplish, if they had the aid of the public press. *Ed. Farm. Lib.*]

the ground must be in some measure prepared before it is sowed. Where young people are barely taught to copy

"Command you may
Your mind from play

—as in some States, where it is the great boast that all *can* read and write—there will yet exist as little sensibility to the charms of literature, or relish for informing books, as where there has been been not even such a mere apology for education.

In New-Jersey, for example, a State exempt from debt, enjoying an ample income, with every resource that freedom and prosperity can afford for the perfection of her industrial and social systems—yet even in that State we have it in proof that not more than half the rising generation are known to avail themselves of the schools provided for them, such as they are; and that those who do attend them average not more than *two weeks in the year!* * Now of what avail, Sir, for any intellectual or useful purpose do you suppose would be the cheapest literature to people thus schooled? It is in their most youthful days, with both sexes, that a taste for books must be imbibed, just as the young ox only is taught to bear the yoke, and the youthful dog to fetch the duck. Habits must be formed and tastes acquired while the physical and intellectual natures are yet in the course of development, and as soon as the constitution of the mind and body will take the impress you desire to stamp on it; and this eagerness for the treasure contained in books may be imparted as soon as the child can learn to read—even at four years of age—if we had books better adapted to that period and purpose.

In too many of such as have been got up for that object, the work has been addressed too exclusively and too long to the external or mere animal senses and imagination of the child. The reasoning faculties have been too slowly brought into exercise. It has not been well considered how the mind, as soon as distinct ideas are acquired, is capable of combining them, nor how language may be so let down, as it were, and simplified, as to place knowledge and the rudiments of knowledge within the reach and comprehension of the child, as soon as the senses become susceptible of distinct impressions. Even the parent bird would teach us a useful lesson on this point, if we would mark how she tempts her callow young, by every motive and device, to follow her a-wing, even before it would seem to be safe to leave the nest. The great desideratum is to throw into these first incipient teachings as strong an infusion of thought as the youthful mind can be made to bear, and soon it would be found that intellects so managed would achieve, comparatively, as early a development, and as much alertness and power of self-support, as does the body of the rope-dancer, which owes all its extraordinary suppleness and activity to *early training*.

A work thus fitted at once to entertain and to strengthen the mind of young children—to inveigle them, if I may say so, into the love of virtuous knowledge, and to fix upon them a habit of pursuing it in books, even before they are aware of it, has just been produced in Paris, writen by a man of no less distinction than the *Professor of Philosophy* in the Royal College of Poictiers, M. CHARLES JEAUNEL. This little work—in which sketches of sacred and secular biography are blended with glimpses of natural history, all in a style equally simple and attractive—has just been translated, as I happen to know, by Mr. F. G. S., for the use especially of his own children, and might well be placed in the hands of every mother in the land, to assist them, on whom, after all, the task chiefly devolves to "teach the young idea how to shoot." Ay, to the honor and glory of the sex

* By the Census of 1840, there were in New-Jersey 6,385 over 20 years of age—white persons—or 17 out of every 1,000, who could neither read nor write; in Pennsylvania 20 out of every 1,000, and in Virginia 79 out of every 1,000. But it is an interesting question, were it possible to solve it, what proportion of those who can *barely read and write* have ever gone far enough to get a taste of the pleasures of knowledge or the least love for books. Any fool may shoot down a bullock in the field, but it takes early associations and practice, and a certain degree of wood-craft, to make a *sportsman*. Any man may bait a hook, but only a true disciple of Izaak Walton can wait all day for "one glorious nibble." *Ed. Farm. Lib.*]

be it said, how many luminaries of their age have referred to maternal supervision and teachings for the germ of all their usefulness, and their rich harvests of renown in after life!

NEW BOOKS—OMOO, AND TRAVELS IN PERU.

On intimating to my good friends, the liberal booksellers referred to, my purpose to while away some weeks in the mountains of Virginia, they kindly stocked me with their recent publications for light reading, in which I shall find some passages fitted for your journal. The first opened by chance was Omoo, of which the contents are as light and worthless, but not so gay and brilliant, as the very thistle's-down. Its more illustrious predecessor, Typee, which I have not read, had won distinction for the author, evincing for him capacity to use, if not in some measure to supply, materials for a highly entertaining work; but for Omoo, it would be easy to work out a better work from the adventures before the mast of any whaler out of New-Bedford.—The next I opened, published by Wiley & Putnam, was "Travels in Peru, by Doctor J. J. Von Tschudi," who, says the Editor—with what entire accuracy this deponent saith not—lays claim to no merit beyond the *truthfulness* of his narrative. His pictures of Nature, he adds truly, especially those relating to the animal world, are frequently imbued with much of the charm of thought and style which characterizes the writings of Buffon.

Though your readers might be amused, and in some respects instructed, by his observations on the social condition and habits of the several communities he visited, and yet more with his zoölogical sketches, to make my extracts acceptable to yourself, they must, I am aware, be of a nature at least nearly akin to the chief purposes of your journal. Some of those selected seem to possess the more interest just now, as they relate to animals and vegetables the growth of Peru, many of which may doubtless be acclimated with us, especially in the Southern States, and for the introduction of which a favorable opportunity seems to be presented in the mission of Mr. Williamson, with facilities offered, as you inform us, by the Government. I would here refer to the Alpacca and other Peruvian sheep, sketches and descriptions of which you gave us, together with names of the vegetables of South America, long since, in the American Farmer. Doctor Tschudi speaks, as you will see by the accompanying extracts, of the celebrated highways and works constructed for Irrigation, nobody knows how long before the Conquest of Peru—of their riding and driving Horses, their equipments and training—Mules—Plantations—Cotton—Sugar—Tobacco—the Olive, and other oil-trees—various kinds of Grain—Maize—Quince—Potatoes, and other tuberous roots—Plants used for seasoning—Clover—Fruits—Figs and Grapes—the Chirimoya—the Palta—the Banana and other fruits, and others of more or less value and promise, some of them unknown to our country.* But first, I must give you the observations of this disciple of the German philosopher in Metaphysics and Archæology, on the

COMPARATIVE NATURAL CAPACITIES OF THE WHITE AND THE NEGRO RACES.

I leave you to judge how far the characteristics of the negro, designated by a writer who may well be regarded as impartial, at least on this question, apply to the same race in our country. To state facts is one thing, to propagate unestablished doctrines is another; and I believe it may be stated as a fact within our own experience, that the most cleanly, industrious, honest and thrifty of American negroes, bond or free, are such as have been reared in slavery, and yet the more so, in proportion as their duties may have placed them in nearer proximity and personal relation to their owners; but as to their capability for intellectual development under more favorable circumstances, and their acquisitive power of the arts of civilization, and the political virtue and forecast which form the securities for public happiness and respectability, let us wait in hopefulness the issue of the *Monrovian* experiment, with materials smelted, and it must be admitted, much refined, out of the rude African ore. We shall see to what destiny

[* Not to break in too much on the personal narrative of our correspondent, we shall separate his extracts, and publish them separately from the context in which he would have interwoven them. *Ed. Farm. Lib.*]

that Colony will rise or fall, when, if ever, the hand and the counsels of the Caucasian race shall have been entirely withdrawn, and the Colony be left exclusively to its own government and support. Should it rise, as its friends predict, to wealth and power, it will be more than history would teach us to hope for, if the watchful rapacity of the white man does not rob the fruit of which benevolence had planted the seed. It did not avail the lamb to show the wolf who was bent on eating him that he stood uppermost in the stream, and could not muddy it. Again I repeat, let us hope for the best; in the mean time, here are the observations of this acute German traveler:

"In Lima, and indeed throughout the whole of Peru, the free negroes are a plague to society. Too indolent to support themselves by laborious industry, they readily fall into any dishonest means of getting money. Almost all the robbers who infest the roads on the coast of Peru, are free negroes. Dishonesty seems to be a part of their nature; and moreover, all their tastes and inclinations are coarse and sexual. Many warm defenders of the negroes excuse these qualities by ascribing them to the want of education, the recollection of slavery, the spirit of revenge, &c. But I here speak of free-born negroes, who are admitted into the houses of wealthy families, who from their early childhood have received as good an education as falls to the share of many of the white creoles—who are treated with kindness and liberally remunerated, and yet they do not differ from their half-savage brethren who are shut out from these advantages. If the negro had learned to read and write, and thereby made some advance in education, he is transformed into a conceited coxcomb, who, instead of plundering travelers on the highway, finds in city life a sphere for the indulgence of his evil propensities. What is the cause of this incorrigible turpitude of the negroes? To answer this important question is not easy, if we admit the principle that the Negro is as capable of cultivation as the Caucasian: and in support of it, the names of some highly educated Ethiopians may be cited. Those who are disposed to maintain this principle, and who are at the same time intimately acquainted with the social relations of the countries in which free negroes are numerous, may solve the problem. My opinion is that the negroes, with respect to capability for improvement, are far behind the Europeans, and that, considered in the aggregate, they will not, even with the advantages of careful education, obtain any very high degree of cultivation; because the structure of the Negro skull, on which depends the development of the brain, approximates closely to the animal form. The imitative faculty of the monkey is highly developed in the Negro, who readily seizes anything merely mechanical, while things demanding intelligence are beyond his reach. Sensuality is the impulse which controls the thoughts, the acts, the whole existence of the negroes. To them, freedom can be only nominal; for if they conduct themselves well, it is because they are compelled, not because they are inclined to do so. Herein lie at once the cause of, and the apology for their bad character.

"The negro women differ but little from the men, in their general characteristics. They are, however, more active and industrious, and better tempered. As domestic servants, they are superior to the mixed races [meaning mixtures of Indian blood]. They are much employed as nurses, and in those situations they discharge their duties well. Their personal vanity is boundless, and every real they can save is spent in dress and ornaments. It is amusing to see them on festival days parading about the streets, dressed in white muslin gowns trimmed with lace, and short sleeves displaying their black arms. Very short petticoats, seldom extending below the ankle, serve to exhibit the tawdry finery of red silk stockings and blue satin shoes. From their ears are suspended long gold drops, and their uncovered necks are not unfrequently adorned with costly necklaces. A negress, who was a slave belonging to a family of my acquaintance, possessed a necklace composed of five Panama pearls, worth several thousand dollars."

This story reminds me, Mr. Editor, of a slave negress I once saw on Colonel Hampton's estate in Carolina. Her holiday had already commenced at 11 A. M. on Saturday, and her ladyship was boomed out, with her head thrown back, and all sail set, moving like a steamboat into Columbia, probably with the proceeds of her hen-house or truck-patch, to add another to the seven flashy dresses she had been known to display on a single day, on some festival occasion—of which they have not a few.—But to "begin at the beginning," let us speak a word, and they need but a word, of the

CONVEYANCES FROM NEW-YORK TO FREDERICKSBURG.

Properly to estimate the speed and perfection of arrangements for traveling between these points, on various routes, one should have lived long enough to contrast the present with the old systems, when, not many short of a baker's dozen were packed in a stage-coach, and fortunate was he who arrived at Havre de Grace with whole bones late at night, the first day out from Baltimore

or Philadelphia; after being again and again stalled "up to the hub," and occasionally upset. Now you may travel chatting or reading as you go the whole distance of two hundred miles from New-York to Baltimore, in little more than twelve hours. But oblivious of past annoyances, like spoiled children, the more we are indulged the more impatient and fretful we become.

We had in the cars, from the City of "Brotherly Love," to the City of "Monuments," a most venerable couple, types of the olden time, Mr. and Mrs. Cope, of the Society of Friends, in Philadelphia, to whom these our modern contrivances for the annihilation of time and space, must truly have appeared as the work of Arabian enchantment. He is old enough to have enjoyed the acquaintance of Doctor Franklin, to whom, he says, the idea of the "Telegraph" was familiar; but there is reason to believe that the recent suggestion of its feasibility, and thence its actual establishment, is in truth and justice more referable to the learned *Secretary of the Smithsonian Institute*, than either he or others have allowed the public to know.

To be thrown, by whatever chance, into company with such choice specimens of the better days of the Republic as those octogenarian friends, is one of the few agreeable "incidents of travel" rarely to be picked up in the crowds and bustle of universal locomotion nowadays. It was truly interesting to listen to this old gentleman, as he was drawn out to speak of his personal recollections of GENERAL WASHINGTON and the old Congress, as it met in its wisdom in Philadelphia: and to hear him tell how proud he was, then a lad in a store, when charged with a bundle to take home to Mrs. WASHINGTON, the lady of *President Washington!* alas! then it was that the *man made the office!*

One curious fact worth mentioning as to Mr. Cope, and indicative of the progress of our country in one lifetime: he whose name was the first on record as a Philadelphia visitor to the *White Sulphur Springs*, is now wending his way with his aged helpmate, to the same Hygeian fountain. What better proof need we ask of the enduring virtue of its waters! Here, Sir, you must give me leave to mention an incident that if established as a common one, would help to stigmatize our national character. At one point on the road, this ancient couple, who had wintered and summered each other for so many years, were for a moment separated, and I observed that on his return a strapping young woman—for I will not call her a lady—had got into his vacant seat, and refused to restore it, saying there were other seats at his command. Seeing this, I proposed in vain to two young people next in the rear, to offer their seats, for to part these old people, it was obvious, would be like tearing the vine from its supporting tree; but they also refused. I would have cheerfully have relinquished mine to the old gentleman, who was still standing, and whom then I did not know from the Pope of Rome—but that would not have satisfied the case. It was gratifying, however, to see that this rude discourtesy to age, which everywhere commands the spontaneous homage of all well-bred people, produced an evident feeling of respectful sympathy among the passengers hard by, until the old patriarch and his aged companion were again seated, as they had ever lived, like Abraham and Sarah of old, by the side of each other.

I ought not, perhaps, to have troubled your readers with an incident that may seem somewhat commonplace, were it not that it may possibly prevent, in some case, the recurrence of anything so unsightly and unbecoming as is every want of respect to gray hairs; and to take the same occasion to intimate to directors and conductors of railroads, that something not yet established or generally understood, is now needed to regulate the rights and privileges of their passengers in respect of the retention of their seats, the opening of windows, &c. Ought not possession at the start, mauger a momentary absence on the way, to give a right to a seat for the whole route? And again: Have any lady, who takes a whim to keep open a window, or any roué, who may wish to blow off the fumes of an over-night's debauch, or to spit abroad his salivary extracts of tobacco, a right to chill and kill all around them with a piercing current of air: for you must know that, as truly saith the Spanish proverb, "A current of air that will put out a candle will kill a man!" Or is it even unto death itself that we must leave every one to enjoy, *ad libitum*, the democratic right of doing whatever he pleases!

While honor and gratitude are due, especially to the founders, and to the direc-

tors of all our great public improvements, we may next expect preventive measures against the delay and expensive inconvenience attending the transfer of "through-baggage" from one route to another.

It may not be out of place here, while on the road, to say a word about the

HOTELS IN THE CITIES FROM AND THROUGH WHICH WE ARE TRAVELING.

Public houses of entertainment in New-York are numerous, and those recently built are upon the go-ahead gigantic order of the age. I am acquainted only with two—the old "City" and the spacious "Astor," and he must be hard to please who would not be content in either.

Of others in Philadelphia, besides the "United States" in Chesnut-street, I have nothing to remark. Few can speak by comparison of many in the same town, because if we become unwilling to abandon any of our old haunts, it is such as are found in *hotels* where we have been accustomed to "put up," and been once kindly treated. How sorely disappointed and uncomfortable would be any of the old *habitués* of the "City Hotel" not to find WILLARD standing in the bar, where he has stood for the last forty years, like the picture of the vegetable lamb in Darwin's Botanic Garden, with an air of imperturbable serenity and good humor, never eating, sleeping, or moving out of that one spot!

Without meaning any disparaging comparison, it may be said of the "United States" in Philadelphia, that unless it may be for the few that remain of your staid old wealthy two-bottle bachelors and white-cravat gentlemen, this superior establishment leaves one little to regret, on his own account, at the closing of the incomparable old "Mansion House," even as it was headed by "JOE HEAD" himself. Alas, it seems to be no longer the fashion for the host to preside and "give assurance of a man" at the head of his own *table d'hôte*. With some hosts, the custom, it is true, "were better honored in the breach than the observance;" but the validity of that improvement may well be questioned that would banish from that presidency such gentlemen as JOE HEAD, DAVID BARNUM, JAMES M. SELDEN, and JOHN MINGE. Mr. Mitchell of the "United States" sits at the head of his "ladies' ordinary;" and here be it remarked that one great convenience in having gentlemen in the conduct of hotels is, that with modern conveniences and punctuality in traveling, ladies may, on emergency, venture to go without special attendants, from city to city.

If there be any fault to be found with this well-lighted, airy, and well attended house, it lies in the seeds of dyspepsia that may be lurking, like serpents among rose-bushes, in viands and confectionary, as various and excellent as the best market in the Union and the last refinements of the culinary art can produce.

Baltimore is proverbially well supplied with public ordinaries, several, doubtless, all that could be wished. There is the spacious "Eutaw House" in the west, with very gentlemanly conductors, and other guaranties for safety and comfort. There are hotels near the dépôt where those who go for solid quantity may satisfy the animal man with railroad dispatch. In Light-street is the old "Fountain Inn," that is anything but light, where Col. Howard and Doctor McHenry, and patriots of the days when patriots meant something, used to dine and drink old rum-toddy with General Washington in Bryden's time. But on the strength of acquaintance with it "from the stump," commend me (as in Boston to the "Tremont") here in Baltimore, for the *ne plus ultra*, to Barnum's "City Hotel," still conducted with all the energy and spirit, and the close attention to small things as well as great, which characterized its management under its lamented founder, old "King David," himself. Nor must I fail to refer the weary traveler to the "EXCHANGE," kept by one of his best pupils, Mr. DORSEY, for as kind treatment and good cheer as the heart could wish.

In this utilitarian age, when everything is tested by the *cui bono*, you will not think it amiss to give publicly a small hint—of which some of mine hosts have promptly availed themselves—*to have salt placed at once within reach of every one at the table*—one set at least for every three persons. In all industrial enterprises now the great desideratum, you know, is to *save labor;* and the tavern keeper has no right to compel his guests to help each other to salt any more than to bread or to water. Moreover, servants are not so numerous in any of them as to have half their time taken up in handing the salt backward and forward, up and down, from one to another, at the very moment they are most

needed. As long as small matters continue to make up the sum of social and domestic comforts, none can be too small to be worthy of notice in a journal like yours, which professes to go for the *useful*.

By-the-by, Mr. Editor, since I am at sea under a roving commission, that opens to me every port, and makes every object a fair subject for examination, let me embrace the opportunity to express my testimony in favor of

COLORED AGAINST WHITE WAITERS IN HOTELS.

For this you need go no farther than the great "Delavan" Temperance House in Albany, the "United States" in Philadelphia, and Barnum's in Baltimore, where men of color exclusively are employed. Contrast the docility, prompt attention, and submissiveness of these to the discipline which befits their station, with the air and deportment (with some very clever exceptions) of the half-naturalized, half-taught foreigner, too often picked up on the wharves for convenience, and then only to be retained until they get washed and dressed, and in a few months' breathing the air of our gloriously free democracy they get to be, in their own conceit, quite as good if not a "wee bit better nor their employers," and quite impatient for promotion to a higher office—beginning with a leader at the polls and rising to the Sheriff*alty*, or the Mayor*alty*, or, peradventure, a *Judgeship!* No, Sir; for a ruler, a man of philosophical temper and enlarged views, like Madison or Monroe—unprejudiced and tolerant of difference of opinion where reason is left free to combat it; for a genuine tyrant, an old field-demagogue, who has no idea of that liberty about which he is ever prating, beyond the usages of his party; for companions, give me high-toned, cultivated gentlemen; but for waiters, whether on the coach-box or behind your chair at the *table d'hôte*, to change my plate or to brush my shoes or my coat, give me colored men—and all the better when brought up in the "great house" and manumitted for good behavior, after being educated in slavery to humane, well-bred masters. The most accomplished head-waiter in all Canada, is a mulatto from Baltimore, in the Albion House in Quebec.—And now what shall be said of the

MARKETS IN PHILADELPHIA AND BALTIMORE.

This is a fruitful subject, and would require much more room than you can spare, though it behooves every agriculturist to know in what a good market consists; and all ought occasionally to survey those within their reach with the ambition to supply or improve what is deficient in quantity or quality. I have often heard the late Robert Oliver, who was an early riser and a close observer, and made it a point to go early through the markets where he happened to be, whether at home or abroad—I have heard him often remark that there was no such market *in the world*, take it all in all, as that of *Philadelphia!* In Boston, you are struck with the urbane manners and remarkably intelligent conversation of the butchers; in Philadelphia, with the great attention to cleanliness in their persons and stalls. The two things in which they there appear to me most uniformly to excel, is in their *veal* and *butter*. To their calves designed for veal they never think of giving less than the entire milk of one cow—sometimes more—and thus they bring it to be very fat and to weigh more than a hundred pounds in six weeks; and that, they say, pays better than any other disposition that can be made of either the calf or the milk.* The richness, high flavor and excellence of their butter has been attributed, as I see in your journal, by a nice and accomplished observer of such things, (Doctor Emerson,) to the presence of the sweet-scented vernal grass (*Anthoxanthum odoratum*)† in their pastures. If so, it would surely be worth the while of farmers in the neighborhood of all large cities to patronize that grass. I think it was cultivated near Baltimore by the late Doctor Wilkins, whose memory deserves to rank highly in all agricultural and horticultural annals for his intelligence and ardor in the cause of these kindred industries.

[* For valuable information as to the Management of Cows and Calves, see this and the preceding Number of The Farmers' Library, from Stephens's "Book of the Farm."

Ed. Farm. Lib.]

[† With a more particular description of this grass the reader shall be furnished at the end of these Notes, or in an early number. *Ed. Farm. Lib.*]

One morning's sojourn in Baltimore was embraced to visit the old *Marsh*, or principal market of the town; and sorry am I to say that for all the extrinsic essentials of light, space and cleanliness, it is far below the character of a city so populous and so famed for alertness and vigor in the career of social and economical improvement, on which our whole country seems to have so heartily entered. The side, the center, and the fish-market houses are all too low, dark, contracted and filthy, and as for the regular victualers, in their certainly not *very* white and clean shirt-sleeves and aprons, and, for the most part, coarse and dirty cloths, where there are any cloths, spread over and about their shambles—who that has ever seen them both, but must be struck with the contrast, in the *tout ensemble*, between the Baltimore and the Philadelphia markets, to the disadvantage of the former? Would it be unreasonable to suppose, where faults are so glaring in a matter of such general interest, that the *conductors of the Press*, there and everywhere among the best of police-officers, are too much otherwise occupied to traverse the Marsh Market early on Wednesdays and Saturdays? Where nods that good old sentinel over all her public concerns, the *Baltimore American*, at that early hour? Of what dreams its *Patriot* colleague? While yet the *Sun* has not risen to expose, nor the *Clipper* spread its sails to bring up the lee-way of their monumental City on a point so vital to its character and domestic comforts. Yet it must be claimed for the *materiel* of the Baltimore Market, that while far from being deficient in the essential articles of good beef, and mutton, and poultry, it excels in abundance rather than the quality of its fruit, not bearing comparison with Boston in apples, pears, grapes and plums, though it may boast of its peaches, and yet more of the excellence of its melons, celery and other vegetables—as well as of its *crabs*, hard and soft. And what greater delicacy than this last-named shell-fish without a shell, if in cooking it be divested of the yellow substance—the 'fat'—which gives it an undesirable *acidity*, to the taste of most people? Though the supply of excellent butter has vastly increased, that seems to be an article—I mean that of the finest quality—that can never overrun the demand. Waverley butter sells to-day, as the old Hillen & Hampton butter did thirty years ago, for 37½ cents a pound, even in June. If the same facilities for the farmers were established along the Baltimore and Ohio Railroad that exist on the Eastern railroads, and if the farmers and their wives and daughters on the tide-waters of the Chesapeake, *encouraged by the same helps*, were as thrifty as those in Yankee-land, Baltimore would be of all markets in the Union the best supplied with everything that can give variety and excellence. The over-night's milk is sent perfectly fresh for use, in New-York, the next morning, from a distance of 100 miles. Instead of parading their wives and daughters at fashionable and crowded resorts, how much more useful if they would take them occasionally on a leisurely survey of the industrious habits and convenient and thrifty domestic arrangements and economy of the Northern people. Of all things, an occasional excursion for personal observation, among a thriving and notable people, makes the best "*eye-opener*," as a long-headed Member of Congress from Baltimore City used to express himself.

A word more as to

THE INFLUENCE OF PUBLIC JOURNALS, AND THE GROWTH AND THE MEN OF BALTIMORE.

An interesting account of the exportation of bread-stuffs appeared recently in tne *Baltimore American*, among the oldest, most enlightened and authentic of our commercial journals—one which has grown with the growth and strengthened with the strength of that flourishing city, repaying with interest, by honest and efficient service to the town, all the liberal patronage it has received. On a view of this lucid statement of the trade, and its constant, able advocacy of public works essential to the continued prosperity of Baltimore, my mind has sometimes rambled into reflections which brought me to the conclusion, without any reference to their party biases, that the people of large towns are not generally aware *how much they owe* of their growth and prosperity to *the conductors of leading journals*, watchful over all that may conduce to their development, their stability in well-doing. The influence of such journals, it may be apprehended, is too often felt rather than seen—enjoyed without being acknowledged. True it is that individual mercantile and mechanical enterprise is indispensable, but these journals are no less so, to explore and indicate the available objects and channels for

enterprise, and to encourage patriotic associations of capital for large purposes, beyond the reach of private means. They collect as to a focus, and reflect as from a mirror, the suggestions of individual sagacity and experience, for the establishment of useful institutions, and for the common enlightenment and happiness of all. Such is the high and responsible office of the conductors of leading papers in large cities, demanding the highest order of talents and the purest public spirit. How much more honorable and important, as respects the public welfare, than many political offices of high grade, awarded by the voice of faction, and wielded for factious ends!

Be my location, Mr. Editor, where it may, into whatever situation the accidents of party or the will of power may poke me, I shall ever have a "warm side" for old Baltimore; but those who are enjoying the golden fruits of her prosperity should never forget what they owe to those who planted the tree, and watched and watered it through all the doubtful crises of its growth, and finally handed it over in full bearing to their successors, as the rich inheritance of their cares, their sagacity, their risks, and, in not a few cases, of their sacrifices. Let them never forget that if Baltimore struck her strong tap-root in a happy position, she owes her nourishment and stalwart growth no less to the forecast, the labors, the untiring industry and the constant patriotism of the Wilsons, the Smiths, the Gilmers, the Olivers, W. Lorman, the Browns, Thomases, Ellicotts, Eltings, Sterretts, Thompsons, the Donnells and the McDonnells, &c. of bygone days. But can communities, any more than individuals, plead exemption from frequent want of discrimination, from injustice, from ingratitude?—or why is it that we so often see men courted in the social circle and exalted in the popular regard in proportion to the length of their purses, the frequency of their dinners, the age of their wines, the glitter of their equipages, the influence of their connections and the magnificence of their houses, furniture and style of living; and yet worse, if possible, to their clamorous and hypocritical professions of *love for the dear people!* while the quiet man of inquiring mind and various knowledge, and unobtrusive and vigorous capacity to be useful, is overlooked and neglected! How many ignorant and hollow-sounding demagogues, without one ray of talent or one spark of generosity—how many cunning interlopers and party changelings from political envy and disappointed ambition, high-school Federalists to-day, and Subterranean Democrats to-morrow; affecting to court, while they are known to despise, the "*vox populi*," have been elevated to the highest offices and places of patronage and authority, within our observation, to the utter exclusion of citizens of extensive research, of useful acquirements, of sound scholarship and business capacity, but who scorn to "bend the supple hinges of the knee where thrift may follow fawning." I should say here, with the author of Gil Blas, that while my purpose is to represent things as I find them, God forbid that I should undertake to delineate any man in particular! Let no reader, therefore, assume to himself that which properly belongs to others, lest, as Phædrus observes, he make an unlucky discovery of his own character—*stulte nudavit animi conscientiam.* Without making the application, I will only state a fact. A great work has lately come from the English press, being a consolidated Digest of the Laws which regulate the Navigation and Trade of all Nations, and the Tariffs and Taxes and Restrictions imposed by each State upon International Navigation and Commerce; and also a Digest of the Commercial Treaties which are in force between the respective States of the World. This last, and *chef d'œuvre* in its department of knowledge, is entitled McGregor's Commercial Statistics. The following is the second paragraph of his Preface. To many who read it, in the United States, it will probably be the first intimation of the existence of the "valuable work" referred to, and for which one of the greatest statists of the present day "sent frequently to America without success."

"The execution of this arduous work," says McGregor, "was intrusted to a *very competent publicist*, Mr. John Spear Smith, and the first volume of 700 pages was published in 1833, and the whole, as far as information could then be collected, in four volumes, in 1836." He says farther, he "sent frequently to America" for this "valuable work, without success, owing to the limited number that were ordered to be printed. Each of the American Legations and Consuls have had copies sent them stamped as the property of the United States; and for the perusal of these volumes—as to the first two volumes, I was indebted to

the United States Agent at Vienna, and afterward, for the two succeeding ones, to the kindness of an American Minister." Be it remembered, that this is unbought testimony from a foreigner, and an entire stranger to this *native son of Baltimore*—the testimony of no other than one of the Joint Secretaries of the Board of Trade in Great Britain, chosen for his fitness to prepare an herculean work in the most important of all departments of industrial knowledge—*Agricultural and Commercial Statistics!* Now, Mr. Editor of THE FARMERS' LIBRARY, in respect of this "*very competent publicist*," author of this "*valuable work*," for which McGregor "*sent frequently to America*," this accomplished scholar—son of one of the founders and pillars of Baltimore when it needed support—can you tell me to what high posts of authority or emolument he has been appointed by his native city or State, or by the General Government hard by? Yet how few of those who have, in the mean time been honored, by all parties, with public trusts of all grades, would be capable of writing a "valuable work" on

NATIONAL STATISTICS.

Who can overestimate the labors of the "competent publicist,"' who has the patience to collect and the talents to arrange, lucidly, a body of important statistics?—a work, by-the-by, which every State Government ought to have done periodically and faithfully, particularly as respects its *agricultural statistics*. Sententiously and most truly has it been said by an admirable French author, ALEX. MOREAU JOUNES—Paris, 1847:

"*La Statistique n'est pas moins necéssaire à la vie publique des peuples qu'à leur vie privée; c'est par ses travaux, ses investigations que les grands intérêts, de l'Etat, sont élucidés, approfondis et connus; ses chiffres fournissent les meilleurs arguments, les temoignages les plus péremptoires que l'on prodouise chaque jour au conseil du Prince, au Parlement, et à l'Académie.*"

It would be easy to enlarge on this subject, especially as respects the scandalous ignorance and neglect of their agricultural statistics, by States calling themselves civilized, which might yet be put to shame by reflection on their inferiority in this greatest of public duties, even to the natives of Peru, who, confined between the high chain of the Andes and the great Ocean, had never yet communicated with any civilized people, when Pizarro discovered and conquered them. Yet this new country of what we call barbarians, holding no traditions of descent from any other people, and who had no means or knowledge of writing, but by *cords of different colors*, possessed a system of statistics as complete as the best that we have at the present day. It is computed that 7,000 lives are annually saved in Great Britain by a law founded on a single statistical fact in respect of the ravages of the small-pox. How many of our State legislators have learned the A B C of the statistics of their own State?—But having already too widely digressed, let us embark on the

TRIP FROM BALTIMORE TO FREDERICKSBURG, BY WATER.

For experiment and vanity we took the steamer "*Mary Washington*"—as good as her name would import—at 4 P. M., for Fredericksburg, and a most agreeable trip we had of it—the fare, and attention from the gentlemanly Commander, MYERS, and all on board, everything that the most fastidious could desire. But fully to enjoy the long and winding passage of the Rappahannock, for more than 100 miles, which you enter upon at sunrise and complete before he sets, the tourist must bear in actual or traditionary remembrance, the social reminiscences connected with the times, and the seats, as you pass them successively, of the old aristocracy that illustrated its borders in the palmy days of the Tayloes and Taylors, the Taliaferros, Alexanders, Bernards, Carters, Fitzhughs, Pendletons, &c. Earnestly may it be regretted that we have of those old families no connected and reliable biographical anecdotes and memoirs of their domestic and social economy, pastimes and ways of living; for much may it be feared that in these points of view we ne'er shall look upon their like again, however transcendental may be our "progress," so called! Nothing, truly, is easier than for the social moralist to decry their convivialities, their reckless management and extravagance, if you will, but is it quite sure, Sir, that their posterity do not, with some exceptions, lack their genuine patriotism, and true hospitality, and open-hearted benevo-

lence, quite as much as they do their ample domains, their manly diversions and well-appointed equipages and numerous retinue of loyal and contented dependents? Be it admitted that the sports of the turf and the chase, the lively barbecue, the mirth-inspiring fiddle, the social game of whist, the "sparkling can" and the "flowing bowl" of mint julep and apple-toddy, have all departed among the things that have been; but by what shining and superior virtues been supplanted? Are men of the present day better educated, more polished in their manners, more patriotic, more neighborly? Are the women more refined, more pious, more hospitable, less envious of the rich or more charitable to the poor? And, after all, is not the dilapidation of these old families and estates, where that has occurred, the result rather of our political institutions, and the drain opened by the generosity of the old States to draw off their enterprise and capital to the vast domains they gave away in the West, rather than of any social vice or defect in our ancestors—and therefore, as far as it has happened to be lamented rather than made a matter of unfilial reproach to the memory of those to whom we owe nearly every claim we have, while any shall remain, to national pride and glory? Truly, if our forefathers had all been thrifty niggards, we might now in opulence be enjoying the fruits of their avarice; and if our national domain had been restricted to the limits of the Old Thirteen, who shall say that we might not, ere now, have reached a higher pitch of national excellence in all solid national virtues?—for neither collective nor individual wealth or prosperity depends on mere extent of possessions, but rather on honor, diligence and good government. Judge MARSHALL, *clarum venerabile nomen*, used to say that should our once happy and contented Union ever be rent asunder by internal discord or undue expansion, he hoped, when it should come to be reörganized, that *Maryland, Virginia and North Carolina* would form a *Republic to themselves;* nor would there seem to be anything extravagant or unreasonable in the hope of adequate strength and security in such a Confederacy, recommended as it would be by geographical compactness and sympathy, as well as by homogeneousness of habits and character, when we compare these three of the old Thirteen Sisters, in size and resources, to Governments of the first class in Europe—Great Britain, for instance. As, for example, according to our eminent and venerable geographer, W. DARBY,

England embraces	58,000 square miles	Maryland	11,000 square miles
Ireland	32,000 "	Virginia	61,300 "
Scotland	32,164 "	North Carolina	45,500 "
Aggregate	122,164 square miles	Aggregate	117,800 square miles

Leaving a difference of only 4,697, or one twenty-fifth part, in favor of territorial extent for an Empire that numbers at this day a population of 30,000,000, against

Maryland, in 1840	470,000	Virginia, East	806,942
North Carolina	753,419	Do. West	432,855
Total			2,463,216

And in what element of power or greatness, political or industrial, do the Islands of Great Britain excel these three old States? Do these not, in the aggregate, equally abound with those in mineral wealth? Are not their mines of coal and iron as inexhaustible? Do they not excel in water-power, in timber, in navigable bays and rivers, in valuable fisheries, and in harbors ample and secure, as well as in unsurpassed climate and agricultural *capabilities*—to say nothing of our boasted form and principles of Government, worthy to be propagated with fire and sword, not reflecting that ours is of intellectual organization, requiring those who use it to be morally prepared and educated to understand and appreciate it—as complicated agricultural machines, highly useful and desirable for their labor-saving properties, may not be put into the hands of common operatives, but require men of tact to comprehend and manage them.

But, to speak more particularly of the

AGRICULTURE ON THE RAPPAHANNOCK.

An impression prevails widely that in the Agriculture of this region, and of Lower Virginia generally, is grouped every sign and proof of ignorance, improvidence and mismanagement. Nor is this impression, perhaps, to be wondered at, or ascribed to prejudice or unkindness on the part of those who take but a superficial view, looking first and with admiration, as every one must, at its allu-

vial fertility, its admirable adaptation to the growth of all our cereal products, and its easy and natural accesses to all the best markets, and then at the astounding fact that its population is stationary if not retrograde. On this point it were not easy to speak more pointedly than by referring to the testimony of a writer to be found in The Farmers' Library itself, August number of 1846. In reference to this very district of country, for twenty miles, at least, on the Rappahannock, below Fredericksburg, he says that within the last twenty years the products have greatly increased. Bare fields, a few years since, have become rich pastures; the stock of all kinds has improved in blood and character; dwellings and farm-houses have very generally become more suitable for the purposes of their construction; while some few expensive and beautiful residences have been built, and neat and appropriate churches erected—all indicating an advancement in refinement, comfort and morals. By intercourse with their countrymen of other States, which was almost interdicted before the introduction of travel by steam-power, and the *extension of knowledge by agricultural works*, he says the lowlanders of Virginia have introduced among them the results of experience elsewhere, and the advantages of a *superior kind of farming utensils*. In the aggregate, larger crops of grain are probably made in every county of Virginia, than when a former proprietor of "Mount Airy" occasionally sent in one year thirty thousand bushels of wheat to market, which sold at about two dollars per bushel. The estate referred to, he farther says, has been divided into some dozen parts, and one or more parts on an average produces more, some double the quantity that the same parts produced twenty years ago. This increased product, with fewer laborers, he adds, has been produced by the improved modes of Agriculture, chiefly by manures, draining, and suspension of too much grazing. Marl, lime, clover and plaster, have contributed to these results, besides the judicious application of other manures. Such, Sir, is the testimony of a gentleman "to the manor born," one of the last and the brightest links between all that was and all that is, the best of ours and of the olden time—reared under all advantages to judge and describe that personal opportunity and the highest order of intelligence can give.

When it is considered how many of the most enterprising sons of the Old Dominion have moved off to the South-west, carrying with them thousands of the most efficient laborers, the wonder may well be that the maximum of her productiveness should yet be reaped; nor can it be accounted for otherwise than on your correspondent's well-grounded assumption of more intelligent and improved modes of culture, and the use of more labor-saving implements and machinery, the more perfect plow, deeper and finer tilth, the threshing-machine, the revolving rake, the cultivator, &c., and by a much more careful husbandry of all resources for barn-yard manure, with a better understanding of the uses and value of the marl everywhere underlying their farms. For these last checks to the progress of exhaustion let Virginia be ever grateful to her Taylors and her Ruffins. Here it was, in Caroline, that Arator himself lived, and breathed over Southern Agriculture a spirit of revival that will never cease to have effect. He it was who taught his brother farmers the great secret of improvement, for he taught them *to think;* and cannot one of his sons, Mr. Editor, be moved to revive, through your pages, for the gratitude and emulation of the present generation of cultivators, and for the honor of the profession, the fading remembrance of his devotedness, and very popular contributions to the cause of agricultural improvement? Or is it to be forever that only "through blood and slaughter" men shall win their way to the highest honors and the most lasting distinction?

To comprehend the whole theory and practice of the application of marl, your readers will not need to be referred to the writings of Edmund Ruffin, and especially to his unrivaled Essay on "Calcareous Manures;" but, for an exhibition of its efficacy in a particular and recent case, precisely in this district, where and of which I am writing, take the following, already once transferred from The American Agriculturist to the Richmond Whig.

THE USE OF MARL NEAR FREDERICKSBURG.

Lytton Y. Atkins states as follows:

"The impression has hitherto generally prevailed that the application of marl to poor lands must be limited by the progress of cultivation, and that it could not exert much of its

fertilizing power if applied to such lands without cultivation. This, I think, is an error, as will be clearly shown by the result of the experiment which I will proceed to detail:

In the month of February, 1846, five hundred bushels of *blue* or green sand marl were scattered on a measured acre of land, which was covered with a growth of broom-grass, known to be alike the badge of poverty, and the memorial of mal-treatment in bygone days.

On this land, in March following, three gallons of clover seed were scattered, (red clover,) and in the month of June, 1846, the clover was found to be in a thriving condition, bunches of it having reached the hight of 28 inches in less than three months after the seed was sown. And now (June 12th, 1847,) it has complete possession of the soil, and after having been much injured by a long and severe drouth, that portion of it that has gone to bloom is from 15 to 20 inches high. As I did not wish my first experiment to prove abortive from drouth, I used nearly double as much seed as would, under ordinary circumstances, be requisite. Two gallons to the acre would be an abundance. This land has not had the plow, hoe or spade to operate on it for nearly 20 years. Now it seems to me that the result of this experiment shows conclusively that lands similar to this (which are abundant in Eastern Virginia), having a supply of *blue* marl near them, may be converted into rich grazing lands, without subjecting them to a previous succession of cleansing crops, and thus the farmer could make ample provision for his cattle and other animals, without grazing lands devoted to wheat, corn, &c.

The cost of restoring such land as that mentioned above to fertility, by marling and applying clover-seed, would be from five to seven dollars per acre, and this cannot be considered 'paying too dear for the whistle,' when it is recollected that the land, after the process, would be cheaper at thirty dollars per acre, than it would be at *two* dollars, if left in its previous impoverished condition. In the last mentioned state, it would bring the cultivator in debt; but when improved, it would not only yield enough to meet the expense of cultivating and securing the crops, but would also pay a handsome profit in the investment if valued at thirty dollars per acre."

With all these resources and facilities, it will appear strange that in the last 20 years (from 1820 to 1840,) *Caroline County* should have actually decreased in population from 18,000 to 17,800; but it should be borne in mind that this part of Virginia has been acted upon, with peculiar force, by the drains which have so influenced the spread of population over the whole Union that while, during the last ten years previous to 1840, the population of the seventeen "Atlantic States," including the District of Columbia, increased from 9,182,237 to only 10,689,596, that of the Western and North-western States increased in the same decennial term, from 3,673,900 to 6,302,915, or *nearly doubled in ten years!* while *Virginia* during the same period increased only from 1,211,266 to 1,239,797. *Alabama* swarming with the most enterprising sons of the Old Dominion, has very *nearly doubled in the same time*—increasing in these ten years from 309,206 to 590,756.

Virginia stood, even as late as 1800, ahead of all the Union in population; but, thanks chiefly to her patriotic sacrifice for the good of "all the States of the American Union," a country has been opened in the West seven times larger than all the Atlantic States—without including Texas, with her vast and undefined extent of domain. Let those, then, who would cast a slur on Virginia for the slowness of her growth, remember that she has been sending swarm after swarm into hives of her own providing. Surely, not one of those States which, not sleeping, she allowed to be cut as ribs from her own side, will give her occasion to say:

> "She hath abated me of half my train;
> Look'd black upon me; struck me with her tongue
> Most serpent-like, upon the very heart."

Nevertheless we must be "just and fear not" to admit that there must be *something* destructive or prejudicial in her institutions or policy; else how is it to be accounted for that she should lag so much behind (I will not take for comparison Ohio, a Free, or Alabama a Slave State, but) one of the Old Confederacy, which resembles without excelling her in any of the natural bases of popular or development of political power—Pennsylvania for example?

If Pennsylvania has her beds of coal and iron and limestone, is Virginia deficient in these minerals? While she greatly surpasses her growing sister in other advantages, as in her navigable waters and water power—in proximity to the ocean; in climate and in agricultural capabilities. Yet it practically behooves her to see how steadily and quietly this and other even of the old Atlantic States

not enjoying equal natural advantages, are shooting ahead of her, on that arena where all the conflicts of political interests, and all the uses of political power are finally exercised and settled; *I mean on the floor of Congress. It behooves her, in a word, to think less of* '98 *and more of* '48. Let us hail as auspicious omens, the signs of

INTERNAL IMPROVEMENTS IN VIRGINIA.

Beside the multiplication of her manufacturing establishments, and other means for bringing her dormant resources into play, a scheme which in its financial features is as novel as it promises to be efficient, is now now in progress for rendering the Rappahannock River available for the transportation of agricultural produce and passengers above the Falls at Falmouth. If such a project has been elsewhere carried out, I am not aware of it. Two or three individuals, as I understand, have undertaken to revive and execute an almost obsolete act of incorporation, to make that portion of the river boatable by canal, and yet more by slack-water navigation. They went round, it seems, from farmer to farmer, throughout the bordering country, and obtained their bonds, each to contribute what he said he would be willing to *give* to have the river made navigable to a given point within a certain distance of his farm. Having thus obtained from responsible persons bonds to the requisite amount, these two or three individuals transferred them for a good bonus to moneyed men, who were willing, on the faith of them, and the tolls arising on the trade, to go on with the work, they of course owning all the stock, and receiving all the tolls, to the payment of which the obligees of the bonds, mind you, are as liable as others.

This, you will say, was quite liberal on the part of the farmer-contributors, and quite a safe "business transaction" for the moneyed men, who, be it said, generally get to be such by having an eye to the main chance—and yet it may have been decidenly to the interest of the farmers to get the work done on such terms. With a like manifestation of public spirit and selfish enterprise combined, how many desirable improvements might be accomplished in different parts of the country, if we had the men of energy to undertake them!

It is said that by the close of autumn this work will be completed as far as Lee's Springs, near Warrenton, about 56 miles above Fredericksburg; and this, I rejoice to say, is only one among other expressive signs that this old State, alive since '98 to nothing but party politics, is awakening to a perception of the value and availability of her long-neglected resources. Did you never, when a boy, see a land terrapin play 'possum, and refuse to move until he felt the coals burning through his back. And now, gentle reader, if not wearied out with my digressions, I must ask you to accompany me, *en cheval*,

FROM THE VALLEY OF THE RAPPAHANNOCK TO THE VALLEY OF THE SHENANDOAH.

Leaving Fredericksburg, which lies in Stafford, by some accounted the poorest county in the State, we traveled over a high, poor clay soil county, part of it significantly yclept "The Wilderness," stopping once on the way to bait our horses and to regale ourselves with that feast by the way-side of all others most relished, if composed of a few "biscuit," a cold chicken, and the hock-end of an old ham, to be eaten in the shade of a spreading tree near a cool spring, with barely enough left to hand over with a kind good-will to your trusty servants.

For this-country roads, considering that no Grand Jury is soon to sit, we were blessed with a remarkable exemption from accidents and mishaps on the way,* having only once "mired down to the hubs" in this beautiful month of June. Fortunately, by the aid of some kind colored men and their teams, we were lit-

[* In Maryland the county roads are what they call "mended" twice a year—spring and fall—just before the sessions of the County Courts, to please and satisfy the Judges, tho Grand Jurors, and the Lawyers from a distance, who are looked upon by the "common" people as beings of a superior order: next come the Doctors, next the Merchants, and then the *Farmers*—always last in their own esteem. What boy is ever taught the principle of road-making, except at the *Military Academy?* The loose dirt scraped into these country roads is all carried away by the first thunder-gust, and hence they are not mended until the last days before the Court. *Ed. Farm. Lib.*]

erally backed out of this dilemma, and, after an hour's delay, proceeded for the residence of Col. JOHN THOM, a most gallant and well-bred gentleman, "all of the olden time," as was well evinced by his cordial reception of us, and especially by his solicitude for the comfort of the ladies, without which there can be no pretensions to good-breeding. Though we came upon him unexpectedly at 9 P. M., and found him all alone, for the nonce, it only showed us that "old Virginny never tires." You cannot surprise them with any call on their hospitality any more than you can "catch a weasel asleep." To other people, hospitality comes by education—the Southern gentleman takes it in the natural way. "*Haud experientia loquor.*" Men, women and children—servants, carriages and horses, were all promptly and kindly provided for; and after a good night's rest, the morning, heralded by the songs of birds, offered to us our first view of the "Blue Ridge" Mountains, with their undulating outline, like the mighty waves of a troubled ocean, in the hazy distance.

Berry Hill is one of those large old "places," even yet so common in the South, which Time, that "waits for no man," begins to tell upon, as on its venerable proprietor. It is, in fact, not easy to say how a farm of 1,000 acres can be restored to pristine fertility, on which, during fifty years or more, has been played the game denounced by Poor Richard, of "always taking out of the meal-tub and never putting in." I should suppose, as indeed I am told, that *gypsum* would act well on these lands; but no kind or quantity of grasses which it may be made to produce, and which it is the object of gypsum to promote, if always grazed or otherwise carried off, instead of being turned in, can long enable the soil on which it grows to resist the effect of exhausting rotations of cultivated crops. *Lime*, too, pops at once into the minds of every one as the great *elixir vitæ*, that would in a few years restore this exanimate region, and clothe it again with verdure and fertility; but the distance and dearness of that resource put it out of the question in these upland counties. The truth probably is that only by the "inclosing system," recommended by *Arator*, can any attempt be made toward general resuscitation in the old grain-growing States, where capital and force are so out of all proportion small, when compared to the size of the farms—and even for that there is not of these one-tenth part of what is necessary to bring their arable lands back to an average of twenty bushels of wheat and forty of Indian corn.

Nor are these Southern States the only portions of the United States that are falling into irremediable consumption, under the *syphon-like* operation of our Western domain, which is draining the Atlantic States to the very lees. Behold the famous Western New-York, already sunk to below fourteen bushels to the acre of Wheat, and according to the best opinion, the whole State producing no surplus of that grain, beyond her own consumption, since 1838. Nor is it believed that the surplus produced in Pennsylvania is large, or so great as it was twenty or even thirty years ago. Still there is something extraordinary in the comparative increase of the value of lands and of population in Virginia and some other States, worthy to be investigated by the political economist. For instance—according to Professor Tucker, an eminent statistical writer, as you have said, and as a general scholar an ornament to our country—the decennial increase in the value of land in Virginia has been 31 per cent., while that of her population has been but 7. On the other hand, the decennial increase in the value of land in New-York has been been but 27 per cent., and that of her population 37—the average decennial increase between 1815 and 1835.

It is to be remarked, however, that much of this great popular accession has taken place in the *large cities* of New-York and Pennsylvania—that of both *New-York and Philadelphia* bearing, with remarkable regularity, the proportion of one-tenth, to the population of the States. Another reason for the non-advancement of the value of land in New-York, which I have not, or do not recollect to have seen mentioned, is her *proximity to Michigan and other portions of our cheap and fertile Western lands*, almost within sound of the woodman's ax on the frontiers—axes handled, for the most part by her own sons, with facilities for removal, "bag and baggage," that must for a long time retard the general, steady, and progressive improvement of the old States, New-York included. If New-England is in a condition of general amelioration and prosperity, it is because there they have touched bottom and gone through the ordeal. Estates

have been there divided until, generally, they admit of no farther subdivision; and continuing in the same family, their outlines and interior arrangements and fixtures remain, intact, from generation to generation; and *moreover*, because of the great number of thriving, well-fed *non-producers* in every neighborhood, to create ready and remunerating demand for the farmers' produce, from the larger staples down to his apples and his pigs, and all his "odds and ends," even to a pint of buttermilk. In 1820 the population of Virginia and New-York were very nearly the same, each a fraction over a million. Then Virginia had only seven persons to the square mile or 640 acres, while New-York had twenty-seven. Since then the population of Virginia has increased only 174,468, while that of New-York has increased 1,373,463, having more than doubled in twenty years.

The fact is, there might be 500,000 able-bodied men added to her present force, and profitably employed in Agriculture in Virginia, that is, in a way to gain a comfortable livelihood, and to regenerate the whole country. Ten New-England families would grow and flourish on the very estate upon which I am writing, of one thousand acres, all in view. But, says the reader, after all, why so eager for more people? Do numbers constitute prosperity or happiness? Is not Ireland at once one of the most populous and at the same time most degraded and miserable countries in the world? All very true. Numbers are not always identical with prosperity or power; but in our confederacy or partnership Government, the members of a State constitute *its stock in trade! its political power!* its share in the direction and distribution of the proceeds and the surplus of public property and income. In proportion to its *numbers* does each State participate in the origination of all money bills, the imposition of taxes, and—what is yet more dangerous, because insidious and imperceptible to the senses of the people—the power of *borrowing money* and accumulating debt upon the *landed interest*, which is looked to, after all, as the great, substantial, tangible security. In a word, it is on the *floor of Congress* that the shoe begins to pinch Virginia and all the old Middle and Southern States, and will pinch them still harder!

But, Sir, you have not room for these speculations; and, besides, as you have intimated, some people may begin to inquire, What has a "FARMERS' LIBRARY" to do with *political economy and the acts of Congress?* No matter how directly or how heavily they may bear on the agriculturists of the country. And so, after a true Virginia breakfast, we must say *farewell* to Berry Hill and to its estimable and hospitable proprietor. If you would judge of his stock, and have any claims on her hospitality, even the little that I had, I recommend you, Mr. Editor, to step ashore at Point Coupée, at Col. Taylor's, on the Mississippi, and from the head of his table you may have the honor of being served by a thorough-bred old Virginia lady, and she the daughter of Col. JOHN THOM. Leaving Berryville, we passed by Culpeper Court-House, and so on by Woodville in Rappahannock, reaching before night "MONTPELIER," the charming residence of Doctor P. THORNTON, where I have amused myself with scribbling this long rigmarole. Proposing to write again from the Springs in Greenbriar, I must now say

Vale-vale. OMOO.

TO DESTROY THE CURCULIO.—A gentleman of this city informs us that a lady of his acquaintance has, for several years past, practiced hanging one or more bottles, filled with sweetened water, or the like, among the branches of her plum-trees, and the result has been an abundant supply of both curculios and plums. The curculios are caught in the bottle, and the plums left to ripen without suffering from the curculios' usual depredations. Some little attention is necessary to note when the bottles get filled, and then, of course, they must be emptied and filled afresh. The gentleman says that this course has been fully successful; resulting in abundant crops from trees so managed, while others around had their fruit entirely destroyed. The remedy as stated is a simple one, and so easily adopted that if in other cases it should not succeed, its expense will be very trifling. [Cleveland Herald.

SHEEP TRADE.—The Pittsburg Gazette says a large operation is going on in an adjoining county in Ohio, in slaughtering sheep, feeding hogs with the offal, rendering the carcass into tallow, curing the hams for market, and preparing the pelts in a mercantile manner. Last season about 20,000 sheep were thus "manufactured." This season 1,000 hogs are fatting at one establishment.

CLIMATE.

In reading accounts of agricultural and horticultural experiments and results as detailed in European works, no man of common sense needs to be reminded that difference of climate should always be kept in view; but the necessity of doing this does not justify a stupid rejection of all such works.

We have repeatedly adverted to this difference of climate, in the way of caution to our readers. On the general subject, we take the following from *Johnson's Gardener's Dictionary:*

Climate controls the growth of plants most imperatively, and in the cultivation of his fruits, flowers, and culinary vegetables, it forms the first object of the gardener's inquiry. He must know the climate in which any given plant is native; and secondly, the soil which it affects, before he can cultivate it successfully. How all-influential is climate appears from the fact that different countries have often a totally different Flora on soils similar in constitution. Thus, as is observed by De Candolle and Sprengel, in *The Philosophy of Plants*, "there are a great many perfect plants which exclusively belong to the Tropics, which never pass beyond them, and which are found equally in Asia and Africa, in America and the South Sea Islands, and even in New-Holland. Although, as we have said, these are rather families, as Palmæ Scitamineæ, Museæ, Sapindeæ, and Anoneæ; or genera, as Epidendrum, Santalum, Olax, Cymbidium, &c.: yet there are particular species, which grow in all parts of the world only between the tropics, as for instance, Heliotropium Indicum, Ageratum conyzoides, Pistiæ stratiotes, Scoparia dulcis, Guilandina Bonduc, Sphenocleæ zeylanica, Abrus precatorius, Boerhavia mutabilis, &c. But most commonly there are other species, which, under the same degree of latitude, supply in the New World the place of related species in the old. Dryas octopetala, indeed, grows equally upon the mountains of Canada, and in Europe; but Dryas tenella of Pursh, which is very like the former, grows only in Greenland and Labrador. Instead of the Platanus Orientalis, there grows in North America the Platanus Occidentalis; instead of Pinus Cembra, in Europe and Asia, there grows in North America Pinus Strobus; instead of Prunus Laurocerasus, in Asia Minor there grows under the same latitude in North America the Prunus Caroliniana. There are many exceptions to this rule, however, depending on circumstances that have been already noticed. In the first place, countries are wont to share their Floras with neighboring regions, especially islands lying under the same latitude, as the Azores possess the Floras of Europe and of Northern Africa, rather than those of America, because they are scarcely ten degrees of longitude from the coast of Portugal. Sicily, and still more, Malta, possess a Flora made up of those of the South of Europe and the North of Africa. The Aleutian Islands share their Flora with the North-west coast of America, and the North-east of Asia. But the most distant countries, lying under the same latitude, may have the same or a similar vegetation, while countries or islands which lie between them have not the least share in this particular Flora. The Island of St. Helena, which is scarcely eighteen degrees of longitude from the West of Africa, and which lies a little farther South than Congo, has yet no plants which are found in those last-named regions. (Roxburgh's List of Plants seen in the Island of St. Helena, appended to Beatson's "Island of St. Helena.") Japan has a great many plants common to Southern Europe, which however, are not found in those regions of Asia that lie under the same latitude.

We must farther remark that the eastern countries of the Old World, and the eastern shores of America, as far as the Allegany Mountains, have a much lower temperature than the western regions; and that it is always colder in Siberia and the North-east of Asia, than under the same latitude in Europe; and, that even Petersburg is colder than Upsal, and Upsal than Christiania; although they all three lie in the sixtieth degree of north latitude. In North America the difference is still greater, and there commonly fifteen degrees of Fahrenheit's thermometer between the temperature of the east and west coast. It hence happened that many plants which in Norway grow under the polar circle, scarcely reach the sixtieth degree on the limits between Asia and Europe. To this class belong the Silver Fir, Mountain Ash, Trembling Poplar, Black Alder, and Juniper. Even in the temperate zone, the vegetation of many trees ceases sooner in the East than in the West. In Lithuania and Prussia, under the fifty-third degree, neither vines nor peaches nor apricots thrive: at least their fruit does no ripen, as also happens in the middle of England. The most remarkable example of this

great difference of temperature is furnished by the Mespilus Japonica, which grows at Nanga Sacki, and Jeddo, under the thirty-third and thirty-sixth degrees of north latitude; and which also grows in the open air in England, under the fifty-second degree of north latitude, when it is planted against a wall.—*Botanical Register*, vol. v.

The same degree of latitude in the Southern and Northern Hemisphere are connected with very different temperatures, and produce a completely different vegetation. This, however, must be understood rather of the temperate and frigid zones, than of the tropical climates, which, as we have already noticed, are pretty much the same over the whole earth. But the summer is shorter in the Southern Hemisphere because the motion of the earth in her perigee is more rapid. The summer is there also colder, because the greater quantity of ice over the vast extent of sea requires more heat for dissolving it than can be obtained; as also because the sunbeams are not reflected in such quantity from the clear surface of the sea water, as to afford the proper degree of heat. It thence happens that in the Southern Hemisphere the Flora of the pole extends nearer the Equator than in the Northern. Under the fifty third and fifty-fourth degrees of latitude, we meet with plants which correspond with the Arctic Flora. In Magellan's Land, and in Terra del Fuego, Betula antarctica corresponds with Betula nana in Lapland; Empetrum rubrum with Empetrum nigrum—Arnica oporina with Arnica montana—Geum Magellanica with Geum rivale in England—Saxifraga Magellanica with Saxifraga rivularis in Finmark. Instead of Andromeda tetragona and hypnoides of Lapland, Terra del Fuego produces Andromeda myrsinites; in the place of Arbutus alpina and Uva ursi of the Arctic polar circle, Terra del Fuego produces Arbutus mucronata, microphylla, and pumila. Aira antarctica reminds us of the Holcus alpina of Wahlenburgh; and Pinguicula antarctica recalls to our recollection Pinguicula alpina. We must recollect, however, that in South America the great mountain chains of the Andes stretch from the tropical regions, almost without interruption, to the Straits of Magellan (from the fifty-second to the fifty-third degree of south latitude), and that, on this account, tropical forms are seen in that frigid southern zone, because the tract of mountains everywhere determines vegetation. It is hence that the Straits of Magellan are prolific of Caronariæ, Onagræ, Dorsteniæ, and Heliotropiæ, which in other parts of the world grow only within the Tropics, or in their neighborhood. In general, the vegetation of the Southern Hemisphere is very different from that of the Northern; and there is a certain correspondence between the Floras of Southern Africa, America, and New Holland. Most of the trees are woody, with stiff leaves, blossoms sometimes magnificent, but fruit of little flavor. In Southern Africa, as well as in New-Holland, it is the form of the Proteæ which prevails, as if appropriated to these regions. Instead of the South American Ericæ, we find the Epacridæ of New-Holland; Lobeliæ, Diosmæ, and a great number of rare forms of compound blossoms and of umbellatæ, are common to all these southern regions."

Now, the reason for these differences is that the countries thus constrasted differ in climate—that is, they differ in the intensity and duration of light and heat they enjoy—they differ in the contrast of their day and night temperatures—they differ in the relative length of the day and night—they differ in the length of their summer and winter, or, which is synonymous, in the relative length of their periods of vegetable activity and rest; they differ also in the amount of rain which falls, not only annually, but at particular seasons; they differ in having much atmospheric moisture deposited in the form of rain or dew, or snow, at different periods of vegetable activity or rest. Now, whatever these differences are, whatever the peculiarities of a climate are from which a plant comes, the gardener cannot cultivate it successfully unless he secure to that plant those climatal differences and peculiarities.

Nurseries.—We learn that nurseries are increasing in every direction; so much the better. It is time to cut down many of our old orchards and begin on better plans. We need not fear being overstocked with winter fruit, for our market is unlimited; we send apples to Europe, to the East Indies, to the West Indies, and to South America. Our northern apples are preferred to those of the Middle States, for they can be longer kept. What can we do better than to supply the world with the fruits that are adapted to our climate? If we cannot compete with the West in the articles of corn and grain, we can raise better apples than any of them and make a more ready market.

We are pleased that many farmers are now aware that one apple-tree in tilled land, or in a hog-yard, is worth half a dozen standing in unbroken sward land.

[Massachusetts Ploughman.

Sheep Husbandry in the United States.—According to a calculation made some few years since, there were in the United States 34,000,000 of sheep. At a moderate and rational computation the value of these may safely be estimated at $70,000,000 and the amount of wool annually produced at $40,000,000. Of this vast flock, the State of New-York owned, at the time of making the above estimate, nearly *one-fifth*. For the five years immediately preceding that time, the increase of sheep in the United States averaged 1,000,000 per year. Since then it has probably been much greater.

THE PRINCIPLES OF ARTIFICIAL MANURING.

(Second Part.)

BY PROFSSSOR JUSTUS LIEBIG.

TWENTY-FIVE years ago, when the manufacture of spa and mineral waters began, they met with violent opposition from the members of the Faculty, as being deprived of all the good qualities of the natural ones—as wanting, in a certain *conditio, sine qua non* —in a *spiritus rector*, or vital power, which alone gave them any medicinal qualities. Those times have passed now—Chemistry has demonstrated to a certainty what the constituents of those various waters are, and under what forms and compounds they are united in them. It has succeeded in combining them exactly in the same proportions, and in rendering them not only equal to the natural ones, but even more effective. Only from that time physicians were induced to connect certain effects on the human body with certain elements in the waters, and were enabled by the light of Science to add more of this element, or more of that; nay, to apply, instead of the waters themselves, the one active element alone, as is, for instance, the case with iodine in indurations and struma. It is well known that at this moment there are extensive manufactures of mineral waters in England, at Berlin, at Dresden, at Vienna, etc.

Now, I believe that the same principle may be applied, partially, at least, to the use of manufactured manures, which, in England, has just been called into existence. Guano, that powerful manure, the efficacy of which, in a judicious application, has been clearly demonstrated by the testimony of the most intelligent farmers, cannot be supplied for a much longer period, because the rich stores in Chili and Africa must be shortly exhausted. As it is only in very dry countries that it is found, we cannot expect to discover many more places containing it, and what are we *then* to do? My attention has often been directed to the question whether, according to our experience and the present state of Science, a manure might not be composed which could replace the genuine guano in its effects, and whether I could not, by a series of experiments, point out a way of preparing one equal to it in all its chemical and physical properties? You are well aware that we know with certainty all the elements of the guano, as well as the urine and solid feces of men and animals. In like manner it seems to have verified the opinion which I have laid down in my work on Agriculture, that the salts manufactured in the laboratory have the same effect on the growth of plants if they are embodied to the fields, in the same forms in which the animals furnish them in their excrements. This must be evident to every one who knows that to produce these compounds in the laboratory, the same agencies and means are made use of which are employed by Nature. The fabrication of a manure, equal in its composition and effects to the solid and fluid excrements of animals and men, seems to me one of the most essential demands of our time—more especially for a country like England, in which, from various circumstances, a rational Agriculture without a supply of manure, in some shape or other, *from without*, seems nearly impossible. Our reasoning will appear the more correct if we remember how different are the results which have been obtained by the different analyses of the different sorts of guano—how little the farmer can depend upon producing from a given *quantity* a certain *effect*, as the latter naturally varies according to the composition of the former. There are scarcely any two samples in the market with the same composition—nay, not even similar. The following salts may be regarded as the essential constituents of a powerful manure applicable to all descriptions of soil:

Earthy Phosphates.—The most important of these is *Phosphate of Lime*, which occurs in nature as a mineral called *apatite*. It is the principal component in bones, which, it may be observed, have been found most efficacious if calcined, consequently deprived of their animal matter. The rapidity of the effects of phosphate of lime on the growth of plants depends upon its greater or lesser solubility. Its amount of glue (gelatine) diminishes this solubility if the soil is rich in vegetable matters, which furnish carbonic acid by their decomposition, and which acid is required for rendering the phosphate of lime soluble in water, and introducing it into the organism of the plants. In the calcined state the bones act sufficiently quickly; but in those soils in which this cause of solubility is wanting their action is slower. In my work I had recommended the addition of a certain quantity of sulphuric acid, both in order to render the bones more soluble, and to change the neutral phosphate of the bones into gypsum, and into a phosphate which contains more acid—superphosphate of lime. I have been informed that this advice has been most extensively adopted, that the superphosphate of lime has been found to be a most efficacious manure, and that it forms already a most important article of Commerce. A second earthy phosphate, not less important, is the *Phosphate of Magnesia*, which it is well

known enters in a still larger proportion than the *phosphate of lime* into the composition of the grain.

The *Alkaline Phosphates*, although not originally found in nature, are important elements of the seeds of grain, of peas, beans, &c. A rational farmer must provide them in sufficient quantities to those plants which require them for their development, from knowing that human excrements increase the produce of grain in a far greater proportion, because they *contain* alkaline phosphates, than the animal excrements, in which they *do not exist*.

The *Alkalies*—potash and soda—must be constituents of every rationally composed manure, because by them the original fertile condition of the fields is preserved. A soil which contains the *alkalies* in too small a quantity is, perhaps, fertile for grain; but is not necessarily so for turnips or potatoes, which require a great quantity of alkali. By supplying an alkaline manure, fallows or the cultivation of those plants which are grown during the time of fallowing, become less necessary.

Sulphate of Potash is a constituent of all plants, although in small quantity, as well as *common salt* and *chloride of potassium*, which are found in milk in rather a large proportion. The *salts of lime*, especially *gypsum*, are important nourishment for the leguminous plants. *Silica* is never wanting in all sorts of soils—it is a constituent of all rocks, by the decomposition of which all productive soils are formed, and the Cerealia find it everywhere in sufficient quantity, and in a form capable of being taken up by the plants, *if the alkalies are provided* wherever they are present in too small quantity.

Salts of Ammonia.—It may be regarded as certain that the nitrogen of the plants is derived either from the ammonia of the atmosphere, or from the manure which is provided in the shape of animal fluid and solid excrements, and that nitrogenous compounds exercise an effect on the growth of plants only in so far as they give up their nitrogen in the form of ammonia during their decomposition and decay. We may, therefore, profitably replace all the nitrogenous substances with compounds of ammonia.

Decaying vegetable matters, which contain carbon, are useful to the fields in so far as they provide a source of carbonic acid; but they are quite dispensable in manure, if it be rationally combined, as the atmospheric air is an inexhaustible source of carbonic acid, from which the plants derive their carbon, *i.e.*, if in the manure, the mineral substances are provided which are necessary for the assimilation of the carbonic acid. These are the substances which *together* give fertility to the soil; but, although each of them may, under certain circumstances—viz., where the soil is defective, or where it is not indifferent to the plant to take up one instead of the other, as, for instance, may be the case with soda instead of potash—increase the fertility, no *one* of them can be regarded as manure, according to the common meaning of the word, for the simple reason that only *all of them, in certain proportions*, will fulfill the purpose for which the common manure is applied. This purpose is the restoration or an increase of the original fertility, and by manure we must replace all the constituents of the plants which have been taken away in the harvest, or which are contained in the plants which we are desirous to cultivate.

What, then, are the constituents of the soil which we remove by the straw, seeds, tuberculous roots, stalks, &c., of our plants of culture? It is obvious that we must know these first, in order to *restore* them in sufficient quantities. To this we answer, by giving the analysis of the ashes of plants and their seeds. Hundred weights of the ashes of the following plants contains—

Constituents.	*Straw of*				*Ashes of*
	Beans.	Peas.	Potatoes.	Clover.	Hay.
Alkaline Carbonates	22·38	12·43	4·34	31·63	3·0
Carbonate of Lime	39·50	47·81	43·68	41·61	6·9
Phosphate of Lime	6·43	5·15	5·73	1·180	40·8
Phosphate of Magnesia	6·66	4·37	7·82	0·91	
Sulphate of Potash or Soda	12·40	10·15		2·23	8·84
Magnesia					21·8
Chloride of Sodium or Potassium	0·28	4·63	2·8	2·27	3·06
Phosphate of Iron Phosphate of Alumina, &c.					1·27

In these analyses silica has not been taken into account, as it is found in all soils, and need not be supplied. One hundred weight of the ashes of potatoes, and the seeds of the following plants, contain—

Constituents.	Potatoes.	Wheat.	Beans (*Vicia faba*).
Alkaline Phosphates	15·75	52·98	68·59
Phosphate of Lime and Magnesia	9·00	38·02	28·46
Phosphate of Iron	0·20	0·67	
Sulphate of Potash	15·07		1·84
Carb. of Potash and Soda	51·70		

What is wanting in the 100 of the above analyses is sand, coal, or loss. From these researches it appears that for stalks and leaves we require other elements than for seeds. The former contain no alkaline phosphates, but they require for their development and growth a rich supply of alkaline carbonates and sulphates. On the other hand the carbonates are entirely wanting in the seeds, which, however, are very rich in phosphates. It is sufficiently obvious that a rational farmer must supply both, as well as all the others. If he supply only phosphates, and do not restore the alkaline carbonates, his soil will become gradually barren—it will be exhausted in those necessary elements for the development of stalks and seeds, without which no formation of seed can be expected. If he supply the alkalies, lime, and sulphates alone, in a given time he will get no more grain. All constituents of the manure, if they are supplied *alone*, have this great defect, that by them the soil is impoverished in other equally important substances. No *one* of itself can maintain the fertility. Keeping this in view, we may easily judge of the comparative value of artificial and natural manures, and all the various *arcana* which have been praised as *panaceas* for exhausted soils.

It is not less easy to understand why the farmers have such different opinions on the relative value of the constituents of manures —why one, whose farm is rich in phosphates, produces an uncommon fertility by the application of nitrate of soda, or the supply of alkalies, while another does not see any favorable effect at all; why bones—phosphates of lime—produce in many fields wonders, and are not of the slightest benefit to others, which are deficient in alkalies or alkaline salts. From the composition of animal manures, it results with certainty, that by applying the latter—solid and fluid excrements of men and animals—we supply to the soil not one but all the elements which have been taken away in the harvest. Fertility is perfectly restored to the field by a corresponding supply of this manure, and it may be increased by it to a certain limit. This will be the more intelligible, if we compare the mineral elements of the urine of horses and cattle with the mineral elements of herbs, straw, roots, &c., of our cultivated plants. It will be found that in their quality they are perfectly identical.

Constituents.	Urine of a Horse.	Of another.	Of Oxen.
Carbonate of Lime	12·50	31·00	1·07
Do. of Magnesia	9·46	13·07	6·93
Do. of Potash	46·09	40·33	77·28
Do. of Soda	10·33		
Sulphate of Potash	13·34	9·02	13·30
Chloride of Sodium	0·55		0·30

These salts in the urine of horses amount to nearly 4 per cent.; in that of oxen to 2½ per cent. of their weights. If we compare the composition of these different sorts of urine with the composition of the straw of peas, beans, and potatoes, of clover and hay, it will at once be obvious that in stable dung we replace by the urine the alkaline carbonates which we have removed in harvest. What in this urine is wanting in phosphates and carbonate of lime and phosphate of magnesia, forms the principal constituents of the solid excrements of animals; *both together*—solid excrements and urine—restore to the field its original composition, and thus a new generation of cultivated plants meet with the mineral ingredients necessary for their development. If we farther compare the guano and the fæces of men with the composition of the animal urine, the analysis shows that both are entirely defective in *alkaline carbonates*—they contain phosphates and sulphates as well as chloride of sodium, but no free alkali—they contain phosphate of lime and phosphate of magnesia; in short, their elements are in *quality* identical with the important mineral elements of the seeds of wheat, peas, beans. The urine of swine is in its composition intermediate between the urine of man and horses.

Analysis of the Urine of Swine.

Carbonate of Potash	12·1	The solid excrements of swine contain principally phosphate of lime.
Phosphate of Soda	19·0	
Sulphate of Soda	7·0	
Chloride of Sodium	53·1	
Do. of Potassium		
Phosphate of Lime	8·8	
Do. of Magnesia		
Traces of Iron		

What the practical results of a knowledge of composition of these manures are, is clear. If it were possible to provide our fields with the dung of swine in sufficient quantity, we would replace by it, in a soil which contains *silica* and *lime*, all the remaining elements of the plants—the field might be made fertile for all kinds of plants—we have in it not only alkaline phosphates, the principal elements of the seeds, but also alkaline carbonates, which are required by the leaves, stalks and roots. This purpose cannot be attained, however, by manuring with guano or human excrements alone, but perfectly so by stable manure, from its containing alkaline carbonates. If I have said that stable manure contains the mineral elements of the nurture of the plants, exactly in a state and condition

in which they are furnished by Nature—that a field manured by it resembles the primitive state of America and Hungary, this assertion will not be found exaggerated. It is certain that stable dung contains no alkaline phosphates, but Nature does not furnish these to the plants even in the most fertile soil, although we find them in large quantity in all the seeds of wild plants. It is obvious that, notwithstanding their absence from the soil, the phosphates are formed in the organism of the plants, and they are produced from the phosphate of lime and magnesia and the supplied alkalies, by an exchange of the elements of each. The alkalies are necessary for forming *alkaline phosphates*, which cannot originate in the phosphate of lime alone. Both together are present in stable dung. In human excrements and in guano, the alkaline carbonates are entirely wanting. The practice of the farmer, in some places, of supplying to the field not pure guano, but a mixture of it with gypsum, shows clearly that the phosphates of alkaline bases are really formed on the organism of the plants from the phosphate of lime and magnesia, because this mixture (guano and gypsum) contains less phosphate of potash or soda than the guano itself; or, in certain proportions of gypsum, no alkaline phosphates at all; the soluble phosphates in the guano decomposing the gypsum into phosphate of lime and magnesia, and into sulphate of potash. I am far from asserting that we should not provide the fields with alkaline phosphates; the excellent effect of the guano and of the human excrements is too well known to question it, and we perceive from this fact that plants are in this respect like domestic animals which, with a normal food, are healthy and strong, but do not fatten. On the contrary, we know that if we prepare the food of these animals artificially, so as to render it more easily digested and assimilated, they are enabled to consume, in a given time, a greater quantity of it, by which all their parts increase in weight. The same happens with plants: if we give them their nourishment in a state most appropriate for assimilation, their capability to attract the gaseous elements from the atmosphere increases and their development is accelerated. If we recollect that the favorable effect of guano upon our fields depends on its amount of *ammoniacal salts*, of *alkaline phosphates* and the *other mineral constituents* of the seeds, but that it is deficient in *alkalies*, the principal constituents of the *herbs*, *straw* and *roots*, it is easily understood why the opinions of farmers on the value of guano as a manure are so very different. On a soil which is defective in alkalies its effect is small; on a soil rich in them it increases the produce in a remarkable degree; but, as I have already observed, the continued application of guano must gradually diminish the fertility of our fields for a number of plants, because the elements of those organs, of the leaves, stalks, roots, &c., without which the plants cannot be developed and cannot produce seeds, are taken off in the harvest without any restoration of them. I think it, therefore, certain that the stable dung can replace the guano to a certain degree, but not *vice versa*. A rational agriculturist, in using guano, cannot dispense with stable dung.

During my excursions in England, I have repeatedly directed the attention of the agriculturists, as Messrs. Pusey and Miles will, perhaps, recollect, to the necessity of supplying the alkalies, and not merely the phosphates and other salts; by a partial supply the equilibrium of fertility is not restored, and if we supply guano alone, we do not act wisely, because we consume our capital by rich interests, and leave to our children an exhausted soil.

And now the principles above-mentioned must guide us in the manufacture of an artificial manure. If they are neglected—if the artificial manure is defective in one or two of the necessary ingredients—the farmer, in making use of it, will, in a very short time, discover the fact by the injury he will have sustained.

In the manufacture of an artificial manure, it must be kept in view that the application of stable dung, of human excrements, and of guano, is attended with a great loss, in consequence of the too great solubility of their most efficacious constituents; and this must be prevented by artificial means. This is evident, if we remember those countries whence guano is derived. It is known that the collection and preservation of the excrements on the African islands, and the coasts of Peru and Chili, depend upon the scarcity of rain in those countries. The best sorts of guano contain, in fact, more than one-half of their weight of soluble salts, which, if exposed to the rain, are in exactly the same condition as, under similar conditions, a heap of *salt*. They dissolve in water, and are removed. Some months of rain would deprive those countries of all their riches. The remainder would have lost the greater part of its fertillizing power. Such effects, however, take place upon the guano with which our fields are manured. Only a small portion of its efficacious salts produce the beneficial effect they are capable of doing, the greater part being carried off by the rain. The stable dung is, in this respect, in the same condition as guano; indeed, its principal compounds are already in a dissolved state, and, therefore, are carried off more easily than those of guano.

A covering for those places in which stable dung is preserved, in order to shelter it from the effects of the rain, has been regarded in Germany as essential for preserving its manuring power. In consequence of the experience that the soluble elements of stable dung are the most efficacious, it has, in some cases, been drawn out with water, and it has been found advantageous to carry *only this fluid* to the fields. I need only refer to the foregoing analyses of the urine of animals, in order

to see upon *which elements* of it this effect depends.

The reason why, in certain years, the influence of the best and most plentiful manuring is scarcely perceptible, is that during the moist and rainy springs and summers the *phosphates* and *other salts with alkaline bases*, as also the *soluble ammoniacal salts*, are entirely or partly removed. A great amount of rain and moisture removes, in the greatest quantity, the very substances which are most indispensable to the plants at the time that they begin to form and mature seeds. The system of draining, which of late has been so extensively followed in England, brings the land into the state of a great filter, through which the soluble alkalies are *drawn off* in consequence of the percolation of rain, and it must, therefore, become more deficient in its *soluble* efficacious elements.

Attentive farmers must have observed that after a certain time the quality of the grain on land laid dry according to this principle, deteriorates; that the produce of grain bears no due proportion to the produce of straw.

What is more evident, after these remarks, than that intelligent farmers must strive to give to the soil the manuring substances in such a state as to render possible their acting favorably on the plants during the whole time of their growth? Art must find out the means of reducing the solubility of the manuring substances to a certain limit—in a word, of bringing them into the same state in which they exist in a most fertile virgin soil, and in which they can be best assimilated by the virgin plants.

The attention which I have paid to this subject has been crowned with success. I have succeeded in combining the efficacious elements of manure in such a manner as that they will not be washed away, and thus their efficacy will be doubled. Owing to this, the injurious consequences of the present system of draining are removed; Agriculture is placed upon as certain principles as well-arranged manufactories; and instead of the uncertainty of mere empiricism, the operations of Agriculture may be carried on with security, and in place of waiting the results of our labors with anxiety and doubt, our minds will be filled with patience and confidence.

(Signed) DR. JUSTUS LIEBIG.

Giessen University, 1845.

NEW GRAPES.

Hill-Side, near Meadville, Pa., Nov. 18, 1846.

John S. Skinner, Esq.—*My Dear Sir:* The letter of Mr. Charles Sears came to hand in an envelop, and with an endorsement from you. In reply—I will take the greatest pleasure in forwarding, by the first opportunity, the cuttings of the White French Grape. They shall be sent, should I be obliged to defer it till our merchants visit New-York in the spring. They will be directed to you or Mr. Greeley. I thank you most sincerely for the grape-seeds. I have not been so selfish as to keep all, but made four parcels, three of which I distributed to friends whom I trusted would appreciate them.

I might mention here that a few days since a friend of mine, Mr. Cady, (near Cleveland, Ohio,) informed me that a neighbor has a valuable translucent white variety of grape, which originated lately as a seedling near a store door—supposed to be from a raisin seed; so that if ever you hear of such a variety in that section, you may recollect its origin when others may have forgotten it, or are ignorant thereof.

Most respectfully, your friend and serv't, JOS. C. G. KENNEDY.

Increase in the Value of our Grain Crops.—A writer in the Boston Courier, over the signature of "J. N. B." estimates the rise in value on the agricultural productions of the United States, since September 1, 1846, as follows: On the crop of Indian corn (estimated at 480,000,000 bushels) the advance (estimated at 25 cents per bushel) is $120,000,000; on the crop of wheat the advance is estimated at $56,000,000; on the crop of oats, $16,000,000; rye, $36,000,000; on the crop of hay the advance, in consequence of the increased use of corn and other grains for breadstuffs, is estimated at $45,000,000; showing a total rise in value of $273,000,000.

To the above should have been added an estimate of the amount of the rise in the price of beef, which is intimately connected with the price of hay and of corn. What was the price of beef, June, 1846, as compared with June, 1847, when it was 16 to 17 cents for choice pieces? Colonel Thomas Shelby, of Kentucky, had a drove of 400 bullocks to arrive in New-York the middle of May, that were on the road 80 days, and cost $6,000, from his magnificent blue-grass farm to the New-York markets.

LETTER VIII.

PROSPECTS OF THE WOOL MARKET—FUTURE DEMAND AND SUPPLY.

Amount of Wool which may be grown in the Southern States...If the demand is already supplied, where is it to find a Market?...The cheaper Producer can drive his rival from the market, unless the disparity of Capital is greatly against him...In Individual Capital, the South possesses the advantage over the North...The South can produce Wool cheaper than New-York...North of latitude 40° there will be little difference in the cost of producing Wool...Cost of producing it in New-England—Pennsylvania—New-Jersey—Ohio...The Prairies—Their vast Extent—Their anticipated Advantages for Sheep Husbandry—Flocks driven on them—Anticipations blasted, so far as keeping Sheep economically on the Natural Grasses is concerned...Character of the Prairie Grasses—Flourish but during a short season, rendering the time of foddering longer than even in New-England...Another Difficulty—The Wild Grasses which the Sheep feed on rapidly become extirpated—Statements of theEditor of the Prairie Farmer confirmatory of this, and of the assertion in relation to the length of the time of foddering...His proposition to introduce Grasses which will *grow* in the *Winter*—Impracticability—Reasons...Burning over the Prairies—Objections...Indifferent quality of Prairie Hay...Principal Advantages of the Prairies for Sheep Husbandry narrowed down to two—Cheapness of Land—Privilege of Pasturing the Public Lands...The latter Advantage rapidly lessening...Cost of Preparing the Prairies for Sheep Husbandry—Materials for Fences, Buildings and Fuel entirely wanting on the interior of them...Coal for Fuel plenty, but not economically available...Fences—those of earth inadequate...Hedges—Require *fences* to protect *them* while growing—Their success then doubtful...Timber may be *grown* for all of the above purposes, but would raise the cost of the land above those of the Sheep Lands of New-York and New-England...The Shepherd System as a Substitute for Fences—When the Sheep become numerous, it would cost more to keep them in separate flocks than fences cost in the East...Pasturing in Common considered—The Sheep could not be separated for any ordinary purpose of Sheep Husbandry—There would be no protection against theft, promiscuous interbreeding, untimely impregnation—No way of effectually combating contagious disorders—Reasons...Natural and unremovable Objections to the Prairies—Want of Water—A Climate far more fickle and excessive than in the Eastern States...Shown by the record of the thermometrical observations kept at the Military Posts of the United States...These compared...Wool-growing in Mexico—In South America.

Dear Sir: In recommending the production of Wool on a scale so extensive in the Southern States, as I have done in my preceding Letters, the fact should not be lost sight of, that were these recommendations complied with, one of the great staples of commerce would be enormously increased. The Southern States—the ten* to which I have confined all my preceding remarks and estimates—to say nothing of those in the same latitudes *west* of the Mississippi—include an area of 450,000 square miles, or 288,000,000 square acres. Allow one-eighth of this region to be in a state of cultivation,† or in natural pastures, and we have 36,000,000 acres which could be more or less devoted to the growth of wool. Assuming that, on the average, every two acres would, under proper tillage, support one sheep, (which, it seems to me, they might do with no very material diminution of present staples,) and that the sheep average 3 lbs. per fleece, the annual product of wool would be 54,000,000 lbs. This amount might be indefinitely added to, by diminishing the production of present staples. How far this could be economically done, experience must determine.

If we concede the adequacy of the present supply of wool to the demand, taking the world together, it is apparent that an increase of 50, 75, or 100 millions of pounds, in one quarter, will produce an over-supply, (and thus greatly depress prices,) unless met by an increased demand, or a corresponding diminution in production, in some other quarter. I do not concede the adequacy of the present supply, but shall, however, waive that point.

The question now arises, where is the wool thus produced to find a market, if the South should, within the next ten, fifteen, or twenty years,

* Nine, besides that portion of Louisiana east of the Mississippi.

† Probably the amount in cultivation, including that in natural pasture, is set down pretty high. It may not exceed a tenth.

furnish such a surplus? Where is the present supply to be diminished, or the demand increased?

Where agricultural competition exists, as a matter of course the producer who can supply the market with the least expense to himself, has an advantage which nothing but a disparity greatly against him in capital can overcome. Large capital, satisfied with less gains than small capital, will sometimes sustain competition with the latter, with the advantages of the cheapness of production *somewhat* against it. But where the difference in first cost is considerable, the cheaper producer can always drive his rival from the market. The aggregate agricultural capital in a region of given size in New-York, probably would ordinarily exceed that of an equal territory in South Carolina or Georgia. But it is not so with individual or personal capital. While the agricultural territory and capabilities of the latter States are in a comparatively few hands, those of New-York and New-England are parceled out among a multitude of small holders, who must realize the first class of agricultural profits, to support themselves and their families. The advantage of capital is therefore, in reality, on the side of the South.

But independent of this consideration, I have already attempted to show that the South can produce wool so much cheaper than New-York, that the latter will stand no chance whatever in competing with her more favored rival—so soon as that rival sees fit to avail herself of her advantages. *North of latitude* 40° *there will be but little disparity in the cost of producing wool;* and therefore if the South can drive New-York to relinquish the production of this staple, she can do the same with all portions of the United States lying north of this parallel, unless on the shores of the Pacific, where the isothermal line is at least 5° north of its course east of the Missouri. I will now enter upon some specifications, and, where necessary, proofs, to sustain this proposition.

New-England has, concededly, no advantages over New-York for the cheap production of wool. Northern Pennsylvania is higher, colder, and more sterile than most of southern New-York. South-eastern Pennsylvania, and the fertile portions of New-Jersey, are the natural producers of bread-stuffs for the less favored regions of those States, and of provisions of all kinds for the New-York City and Philadelphia markets. The high price which good lands bear in the vicinity of such markets, would prevent them from competing with cheap interior lands in wool-growing. There are sheep lands of good quality in western Pennsylvania; and in the southern section, the winters are perceptibly a little shorter than in New-York. This will render the production of wool upon them somewhat less expensive than in the latter State, but it will not reduce it low enough to allow them to compete with the cheaper lands and still shorter winters of the South. The same remarks will apply to the hilly region constituting the south-eastern portion of Ohio.

Proceeding still farther west, we find a region extending to a vast distance whose topographical and geological features, flora, &c., taken in connection, effectually distinguish it from the territory lying east of the Mississippi and Ohio. Vast plains, called *prairies*, (so named by the early French settlers from the French word signifying meadow,) which can be purchased of the Government in the natural state for $1 25 per acre, and which are usually covered with natural grasses—would seem, if these grasses are adapted to the summer and winter subsistence of sheep, and there are no counterbalancing disadvantages, to unite facilities for the cheap production of wool not possessed in any other region of our country. And such superiority has actually and often been claimed for them.

I propose to investigate this question at considerable length, because there are various considerations which, at first view, give great plausibility to this claim. And if the prairies *can* produce wool cheaper than the South, it is in vain for the latter to embark in the business—at least, beyond the extent of supplying the home demand—for so limitless is the extent of these natural pastures throughout the whole northern basin of the Mississippi, that they could, perhaps, supply the entire market demand of the United States for this staple, for an indefinite period, vast as that demand is destined to be.

But a very few years have elapsed since the most sanguine anticipations were indulged in, by large numbers of our Northern and Eastern flock-masters, in relation to the superior capabilities and advantages of the prairies over Eastern lands for sheep-walks; and large flocks were driven hundreds of miles, lands purchased, and establishments created, to realize these supposed advantages. It is not too much to say that these anticipations—so far at least, as keeping sheep on the *natural* herbage of the prairies is concerned, were briefly and summarily blasted. Many of the flocks driven there, actually perished in the midst of seeming plenty. On the whole, the experiment is generally conceded to have resulted in failure. Let us see whether this was occasioned by mismanagement—temporary and removable causes—or whether we must look for those causes in natural and unchangeable circumstances.

A *portion* of the wild prairie grasses are relished by sheep, and they thrive on them; but these grasses, as well as all the other varieties growing there, flourish during but an unusually limited portion of the season. They begin to dry up and lose their nutritive qualities in midsummer, and long before the foddering season has commenced on the bleakest highlands of New-England, they are as unfit for the subsistence of sheep, as dry *brush!* Where the natural grasses are alone depended upon, the foddering season on the prairies, north of latitude 40°, will range from six to seven months—rarely, perhaps, fall short of six, on lands which have been *previously depastured*, provided the sheep are maintained in good condition.

And there is another material difficulty with the prairie grasses which sheep feed on. They soon—many of them even in a single season—become extirpated if kept fed down while growing. This is so singular a fact in vegetable physiology, that I chose to state it in the words of an intelligent resident of the prairie region—whose local pride and partialities would naturally prompt him to give as favorable a coloring to the agricultural advantages of his chosen home, as a regard for truth would admit of. From a communication of J. Ambrose Wight, Esq., Editor of the Prairie Farmer, to L. A. Morrel*—replete with useful information, and characterized by an admirable candor—I make the following extracts:

"Sheep or other stock, but more particularly the former, put upon a given piece of wild prairie, and confined to it, unless the range be very large, would not continue to keep fat one season after another, though they would at first; but if allowed a new range each season, they would always keep fat. The reason is this: Sheep in such cases will go over their range and select such food as they prefer, and will keep at it until it is gone. Hence the wild bean and pea vine, and a few other kinds of plants, will obtain their constant attentions, and will be kept so short that they will, on a given piece of land, die out the first year. Therefore if turned out on the same grounds another season, the best food will be gone, and the poorer, with which they must then take up, and which itself gets continually poorer, will not sustain them in their first condition. A small flock of sheep will thus run over a large extent of ground.

Hence the *utter hollowness of a supposition* which appears to be common at the East, *that large flocks of sheep can be sustained on the wild grass of the prairies alone.* There are many places, it is true, where a farmer might keep a large flock on the wild prairies

* American Shepherd, p. p. 138—145.

during the summer months with profit, provided he had not too many neighbors in the same business. But such flocks would continually lessen their own range, at the same time that it is lessening by immigration, settlement and extended culture. I have been in the country about nine years; having gone, at the first, into an entirely unsettled region, and have paid much attention to the matter; and it is my belief that the wild prairies are desirable for wool-growing to a very limited degree; but that the cultivated prairies are desirable for this purpose to an almost limitless extent."

The following fully sustains my preceding statements in relation to the time of foddering. In answer to Mr. Morrel's question, "what length of time is foddering necessary in Northern Illinois?" Mr. Wight says:

"The seasons have been extremely variable since my residence here—now nearly nine years. The winter of 1842 and '43 was the severest one since the settlement of the State; and the foddering season lasted from the middle of October to the middle of April. The winter of 1843 and '44, and the present one (1844-5) would require foddering for a less time, by full two months. *This is on the supposition, however, that good artificial pasturage is provided.* If the wild prairies are relied on alone for pasture and hay, full two months must be added to the foddering season; and stock would barely get through at that; and I think that sheep, in multitudes of instances, would perish. In this latitude with Timothy, Red-top and Clover pastures, the average time would be from 4½ to 5 months. If a good blue-grass pasture were provided, in such winters as the last and present, it might be reduced to two months, and I am told that some so provided for, *one hundred miles south of here*, have, the present winter, scarcely foddered a tall. I apprehend, however, that our winters here will always be variable, and that it will be far more difficult to predict their length and intensity than in New-England."

In another place Mr. Wight says:

"If, however, the question is asked, 'Does not the pasture on the prairies fail early in autumn, so as to compel the removal of sheep to other pasture before it is time to go into winter quarters?' I answer, yes—long before. In many sections the prairies afford no adequate pasture for dairy purposes after the first of September. . . . . The wild grasses are extremely vigorous while they last, but are all, without an exception, short-lived."

The great diminution of the foddering season, where the domestic or cultivated grasses are already made use of, which Mr. W. anticipates *may* result from the introduction of blue-grass, will be found utterly unattainable. Blue-grass (known as June or spear grass), is one of the commonest varieties in New-York and New-England. Peoria, in Illinois, is in about the same latitude with the City of New-York, and consequently that portion of Illinois north of Peoria, corresponds with a considerable portion of New-York, and all of Connecticut and Rhode Island. And the climate of the former is not less rigorous, and is far more variable, than in the latter named States, as I shall presently show. Now in no portion of New-York or New-England will the blue-grass reduce the foddering season to two months, or anything like it. It is true that small flocks will pick up a subsistence on this and other grasses in the winter, when the ground is not covered with snow, and if the pastures are not fed down in the fall. To suppose, however, that this or any other herbage will *continue to grow*, when the earth is frozen almost to the consistency of a solid rock, far below its lowest roots, is an obvious error. In New-York, the ground remains so frozen usually during the entire winter, and in Northern Illinois the cold is equally intense, and there is less snow to protect the earth from its effects. The ground, therefore, is frozen quite as solidly, and considerably deeper than in the former. Grass left standing for winter consumption, in either State, becomes, by freezing and thawing, tough and innutritious. In New-York, the larger flock-masters have long since ceased to make any provision of this kind, for winter-feeding—preferring to keep their sheep in yards, and entirely from grass.

As Mr. Wight himself very accurately remarks in another part of his communication, "It is found to be decidedly better to keep sheep up in small flocks, with very little ground to run over, while kept on hay, than

to let them run out a part of the time and get such grass as they can pick, while there is not enough to sustain them." But the reason for this given by Mr. W., that "they eat much dirt, are liable to be poisoned and lose their appetite for hay," is very far from being the correct one. Green grass always, in a great measure, deprives sheep of their appetite for dry hay. The grass thus left standing loses its nutritive qualities, so that it will but imperfectly sustain animals, and when the snow falls and covers it, sheep not only cannot obtain it, but they are left without appetite for other food. Open winters, *i. e.*, winters without snow, are always particularly fatal to sheep which are suffered to run on the pastures, in this climate, and for the reasons above assigned. They sometimes appear to be doing well enough up to toward the close of February; but they are imperceptibly losing condition and strength, and when the trying month of March, with its stormy and fickle weather, sets in, they begin to drop off, and all sorts of diseases—grub in the head, "the distemper," etc.—are assigned as the causes.

It is in vain to attempt to shorten the foddering season north of latitude 40°, on this side of the Rocky Mountains, by seeking for any plant to *continue its growth and thus produce green feed in winter*, unless in limited districts, and on the margins of large bodies of water. No plant can draw its nutriment from solidly frozen ground.

Mr. Wight proposes burning over portions of the prairies at intervals, to cause the vegetation to start afresh, and thus prolong the grazing season on the prairies. Mr. Flower makes the same suggestion. In some localities, and under favorable circumstances, this might, temporarily, accomplish the desired object; but as population increases, and buildings and inclosures are erected, it would constantly lead to those unfortunate accidents, which have already, I believe, led at least one of the Western States to prohibit by severe penal enactments, the setting fire to the dead grass of the prairies. Besides, we have Mr. Wight's own authority for stating that sheep actually *extirpate* those of the prairie grasses which they will feed on, so that burning over could not cause *these* to re-sprout the same season or afterward.

It requires but little knowledge of the habits of the sheep to know that grasses rejected by it in summer, will not constitute a proper aliment for it in winter, and that if confined to such food, it will not prosper. A few sheep with liberty to *pick and waste*, will live on very inferior herbage in either summer or winter, (and hence the sanguine and erroneous statements put forth by owners of small flocks on the prairies,) but confine flocks to the same food—flocks which are too numerous to be allowed the privilege of selection and rejection in their food, and the disastrous consequences will not be long in exhibiting themselves.

In reviewing the preceding facts, the principal advantages of the prairies for the production of wool seem to be narrowed down to two points: the cheapness and fertility of the lands, with a contingent right inuring to the settler to use, without paying for it, all the unappropriated public domain! If we admit that the soil of the prairies is as well adapted to the artificial grasses as that of New-York or New-England, (a point which, to say the least of it, is doubtful, for experience has shown it to be otherwise in Michigan and some other portions of the West,) the only peculiar and exclusive advantages which the prairies have over the lands of the old Middle and Eastern States, is their cheapness and freedom from rent where unsettled. Emigration is rapidly abridging the latter privilege, however—more rapidly than can well be appreciated without a reference to the statistics of the several new North-western States. And it will be

remembered that when a prairie is belted round by population, and depastured by numerous flocks and herds, its better grasses—at least for sheep—would be soon exterminated, and, consequently, though there might be ten or fifty thousand acres of common and free pasturage, it would be of trifling avail to the flock-master.

But taking this privilege for what it is worth, and taking into account the difference in the price of lands—calling one $1 25, and the other $20 per acre—and then, in my judgment, the Eastern will prove cheaper, all things considered, than the prairie lands, for Sheep Husbandry. I speak, of course, of the prairies as wholes—not of that narrow margin of each, which is attached to the farms lying partly on the outer and wooded lands.

The prairies must first be plowed, undoubtedly,* to seed them down effectually with the cultivated grasses. It requires from four to six yoke of oxen, says Mr. Solon Robinson, to break up from one to one and a half acres per diem. Suppose we concede this expense to be paid for by the first grain crop used as a covering for the grass; then the prairies are to be fenced—adequate buildings and other fixtures provided, for the use of a family, the storage of hay, the shelter of animals, &c. Where are the materials for these things and for fuel to be found, on a plain wholly destitute of trees, unless on the occasional "islands"—and where stones are entirely wanting, excepting sparsely scattered bowlders, and, very rarely, rocky ridges or cliffs? Conceding that all the wood on the margins of the prairies will not be wanted for the local supply—which, as a general thing, it undoubtedly will—what would be the cost of fences, buildings and fuel, where every stick was transported from three to fifteen miles† by land carriage? Fuel, it has been said, can be obtained from the local depositions of coal. It is true that Illinois and south-western Indiana, at least, constitute one vast coal basin. But any one possessing the slightest practical acquaintance with the subject, knows that it requires associated, aggregate and corporate wealth, to carry on mining operations to an extent sufficient to steadily and efficiently supply a considerable market. Even in a level country where coal is covered with a deep superficial deposition of earth, individuals may, where the stratum is cut through or uncovered in ravines or the beds of streams, quarry their own coal; but such opportunities are rare. The idea that individuals would find it within the compass of their means to sink vertical shafts and raise coal—each one for himself—on the bosoms of the prairies, is utterly preposterous. Coal has never yet borne a price in our *cities*, which would justify even Companies in lifting it by *vertical* shafts. Let the coal, however, be as cheap as it may be, at the points of excavation, the mere cartage of it, for the wants of a five-months winter—where the thermometer frequently indicates a degree of cold from 5° to 30° below 0°—will be an onerous tax on agricultural industry. And canals can never furrow the bosoms of most of those vast dry plains; and ages must elapse before railroads will so interlace them, as to bring coal cheaply within the reach of population scattered over their entire surfaces.

If we suppose that adequate buildings can be constructed, with sufficient economy, with transported timber, the question still remains, What resource is there for fences? Fences of earth have been proposed, but these will not stand long enough to pay for building, unless their sides are constructed at such an angle as would be wholly inadequate to "turn" sheep. Hedges, besides the other considerable expense of cultivating them, would

* I have seen it stated that the seeds of the cultivated grasses would "catch" sown on the surface of the prairie sod! That they would do this effectually and generally, is an assertion which no practical farmer will credit.

† Prairies are from one to thirty miles in diameter.

require *fences* to protect *them* from animals, until they attained a considerable size; and it is exceedingly questionable whether any good hedge-plant can be found, which is capable of resisting the rigorous and fickle climate of the North-western States. The different thorns, and other plants used in England, have generally failed in all the Northern States.

Timber *may* be *grown*, both for fuel, houses and fences, by the proper planting, cultivation and protection of suitable trees—but the expense and delay attending this course would raise the prairies to, or above the price of New-York and New-England sheep lands.

It has been claimed that the shepherd system will render fences unnecessary, to any but a very limited extent, on the prairies. Now, while there is but here and there a settler on the margins of some of these great plains, and while a flock of sheep can constantly seek new pasturage, as the old fails, over a boundless range, without encountering another man's flock, sheep require so little looking after that the shepherd system is entirely feasible and economical, notwithstanding the high price of labor. Under such circumstances, one man, provided with a horse and a brace of dogs, can perhaps give the necessary attention to 1,000 sheep, and have some time for other occupations. But this state of things, terminated already on most of the prairies this side of the Mississippi, will soon be unknown even on those in the territories bordering on the Missouri and its western tributaries. When wool-growers become to any degree numerous on the borders of the prairies, (as they certainly soon will, if these regions do possess any peculiar advantages for this branch of husbandry,) how are sheep to be kept *separate*, without that multitude of shepherds which the same services require in Spain, Germany, or Australia?—and whose labor and subsistence* would cost more, during a series of years, than the *fences* in regions where wood and stone are plenty.

If the sheep are not kept separate—if allowed to run promiscuously together, how could the property of each holder be separated out of the vast general flock on a prairie five, ten or fifteen miles in mean diameter, for the purposes of slaughter, sale, washing, shearing, folding, or any other incident of their husbandry? What protection would there be against wholesale theft, when no man could count his scattered flock? What would prevent promiscuous interbreeding—and what object would it be, therefore, to attempt to procure choice breeds, or improve those already possessed? What security would there be against those vagabond rams which the carelessness of some individual is always sure to let loose on a neighborhood, to beget lambs on every poorly-fenced farm, to perish in the storms of February and March?† Finally, how could contagious and—unless promptly checked—highly malignant and fatal diseases, like the scab and hoof-ail, be met with the proper vigor, and treated with the necessary skill and care, among a multitude of holders scattered over miles of surface; and supposing all the necessary vigor, skill and care brought into action, what would they all avail where it was impossible to separate the healthy from the diseased—the cured from the sick?‡ Let either of these diseases break out among a flock of ten thousand sheep, running together without inclosures, and any one familiar with their diagnosis and treatment, knows that if it were possible to drive them from the flock—which is extremely doubtful—it would cost far more than the value of the

* Costing four or perhaps six times more in this than in the former countries.

† It is questionable whether in a flock running in common on a prairie, one ewe in ten would escape untimely impregnation.

‡ Both of these diseases are susceptible of being communicated from a diseased sheep to one but recently cured of them; consequently, separation is the only safe and economical method, in large flocks, to prevent constant reinoculation.

sheep. True, these diseases have not yet visited, so far I am aware, the Western States. The scab is, in fact, but little known at present in any part of the United States. It may at any time, however, reappear.* The hoof-ail, after the fury of its first onset is over, assumes a milder form—one which does not lead to death, if remedies are applied but once or twice during a season—and for this reason, probably, it is allowed to linger in many flocks in the sheep-growing regions of the U. S. It is a strictly contagious disease, and one animal having it would rapidly innoculate, in the hot weather of summer, by itself and others receiving the disease from it, one or five hundred thousand sheep having access to each other. A few years since it was a stranger to *this* region. Like the small-pox when unchecked by vaccination, or any other contagious malady, it gradually progresses from neighborhood to neighborhood—from State to State. Good fences, confinement to the farm, and a rigorous system of exclusion of all strange sheep, may and do save many flocks from its visitation, but accidents and acts of carelessness are constantly occurring—and so long as they continue to occur, this malady will continue its onward march. I consider it just as certain that it will visit and sweep over the North-western States, as I do that flocks are scattered along between those States and the present seat of the disease. And when it does visit them, if it finds any great flocks congregated on the prairies, not in a situation to be immediately divided into small flocks, I venture to predict that, with all the care and attention which the sheep *will* receive, the miserable animals, eaten while yet alive by maggots—and festering in loathsome rottenness, will perish in multitudes—by whole flocks.†

Another objection to pasturing in common, would arise in the difficulty, if not impracticability, of establishing and *enforcing* an equitable system of joint occupancy, over or around a large prairie, so as to compel each farmer to regulate the number of his flocks and herds by the amount of cultivated pasture possessed by him.

But if we concede all the preceding difficulties to be removable, or even removed; if we suppose the great north-western plains to be amply supplied with materials for building, fences, and fuel—there are two other difficulties in the way of their becoming the best class of sheep-walks, which, from their nature are fixed, and, in the main, unchangeable. I allude to the *scarcity of water*, and the *climate*.

On the "dry and rolling prairies"—those claimed to possess the greatest advantages for Sheep Husbandry—running water is scarce, frequently extremely so. The occasional streams are shallow and sluggish. Washing wool on the back of the sheep, conduces, I think, to the health of the animal. It causes the sheep to shear much more easily—brings the wool into a better marketable condition, and diminishes transportation. Streams of considerable depth and rapidity (where, what is better, falling sheets of water over mill dams, &c., cannot be found), are almost indispensable to an effectual performance of this process. Sheep, also, in many periods of weather, *require* water for *drink*. When they are confined to dry feed, it is indispensable, in the absence of that snow which is often, in the Eastern States, made a substitute for water. Neither are attainable during considerable periods each winter, on the prairies, without resort to a pump—a sorry—and, (including the time of working it, when large flocks are to be watered), an expensive and troublesome substitute for running water.

Finally, the climate of the Western and North-western States is *more*

* Since writing the above, I have found, to my utter surprise, that this disease is within three miles of my own farm, in a flock driven into the country last fall.

† A history of this disease and its gloomy diagnosis, when neglected, will be given in a subsequent Letter.

variable—exhibits *more sudden* and *greater extremes*, than the climates of New-York and New-England. The weak and easily prostrated muscular and vascular system of the sheep, will better endure great extremes of continuous heat or cold, than rapid and marked variations in temperature. Subjected to the latter, catarrh not violent enough to kill in its inflammatory stage, but assuming a chronic form—and followed by a slow and wasting debility, frequently attacks flocks. Sometimes it assumes an epizootic and malignant character—as during the past winter—and sweeps away thousands of sheep.

The isothermal line (or line of equal mean heat), does not vary particularly between the same latitudes in New-York or Wisconsin—or between Virginia and Missouri. But as we leave the ocean and other large bodies of water, the isotheral and isocheimal lines are found to diverge more and more from the isothermal one—and the range of the thermometer (the extremes of heat and cold indicated by it), rapidly increases. The following Table of temperatures, kept by officers in the Army, for a series of nine years, is from Doct. Forry's excellent work on the "Climate of the United States, &c."* It strikingly illustrates the fact asserted. The four points specified are in about the same latitude.

	Highest.	*Lowest.*	*Annual Range.*
Fort Wolcott, Newport, Rhode Island.....	85	+2	83
Fort Trumbull, New-London, Conn.....	87	+9	78
Fort Armstrong, Rock Island, Ill.....	96	—10	106
Council Bluffs, near the confluence of the Platte and Missouri.....	104	—16	120

Doct. Forry states that the mean annual range of the thermometer at the following places, is as follows: at Fort Sullivan (Eastport, Me.) it is 104°, while at Forts Snelling (confluence of the St. Peter's and Mississippi in Iowa) and Howard, (Green Bay, Wisconsin,) in about the same latitude, it is respectively 119°, and 123°.

At Fort Preble (Portland, Me.) Fort Niagara (near the mouth of the Niagara River, N. Y.), Fort Constitution (Portsmouth, N. H.) it is 99°, 92°, and 97°; at Fort Crawford, (confluence of the Wisconsin and Mississippi Rivers in Wisconsin,) on the same parallel, it is 120°.

The above instances are not isolated ones. The same law is found—other things being equal—to generally prevail throughout our own, and perhaps all other countries.†

While the cold of the Northern, and particularly the North-western States, so greatly exceeds that of the Southern States, few would be prepared for the proposition that the extremes of heat in the former, often reach points unknown many degrees farther South! Yet such is the fact!

Fort Snelling, in latitude 44° 53′, and occupying a central position in that vast territory lying between the Great Lakes and the Missouri, and between the 41st and 49th parallels of latitude—and which may therefore be presumed, to a certain extent, to afford a type of the climate of that whole region—feels a maximum summer heat of 93°—*the same* with that of Washington City, in latitude 38° 53′, and Old Point Comfort, Va., in latitude 37° 2′. At Fort Johnston, on the Coast of North Carolina, in latitude 34°, the maximum heat is but 90°; at Fort Moultrie, in Charleston Harbor, in latitude 32° 42′, it is also 90°; at Fort Marion. St. Augustine, Florida,

* See the above named work, p. 43. I am also indebted to Doct. Forry for all the records of thermometrical observations, at the U. S. military posts, which are subsequently quoted.

† Local exceptions exist, owing to the prevailing winds and other causes. For example, Fort Howard is much nearer a large body of water than Fort Snelling. Altitude also exerts its influence.

in latitude 29° 50′, it is 92°; at Fort Brooke, Tampa Bay, Florida, in latitude 27° 57′, it is 92°; and at Key West, *the most southern possession of the United States*, it is 89°!

It will thus be seen that the summer heat rises higher at Fort Snelling than at points on the sea-board more than 20° farther South!

Now let us compare their winter temperature. The minimum temperature of Fort Snelling is —26°.* That at Washington is + 9°; Old Point Comfort + 20°; Fort Johnston + 28°; Fort Moultrie + 21°; St. Augustine + 39°; Tampa Bay + 35°; Key West + 52°! So the greatest cold of Fort Snelling is 35° below that of Washington—the most northern and by far the coldest of these posts—and it is actually 78° below that of a post, (Key West), which its summer heat exceeds by *four* degrees!

At Fort Howard, latitude 44° 40′, the seasons are even more violently contrasted. Its maximum heat is 98°, its minimum—25. At Rock Island, Ill., latitude 41° 28′ we have already seen that the maximum is 96°, the minimum — 10°; and at Council Bluffs, latitude 41° 45′, the maximum 104°, the minimum —16°! At Petite Quoquille, near New-Orleans, the maximum is but 94°, the minimum + 30°!

And an examination of the *monthly* variations in temperature, at our North-western posts, will show that these are as excessive, in proportion, as those of the year—and their suddenness can scarcely be credited by an inhabitant of southern regions—more particularly those bordering on the Atlantic and Gulf of Mexico.†

It cannot be said that Fort Snelling, or Rock Island, or Council Bluffs, have the summers of Italy or the South of France—for the weather is much hotter at intervals, and is subject to far more frequent, abrupt and violent changes than in the latter: nor have these posts winters as mild as those of Europe, many degrees farther north.‡ And their winter exhibits the same sudden and violent changes which characterize the summer climate.

These facts, in my judgment, fully explain the remarkable mortality in the flocks which have been carried on the prairies, and which is usually attributed to over-driving, poisoning, &c. The climate itself, though not always a rapid, will prove one of the surest of *poisons*, unless great care—much greater than is requisite even on the bleak and sterile hills of New-England—is taken to protect them from its deleterious influences.

Facts sufficient have been adduced, probably, to convince every Southern man how much he has to fear, ultimately, from prairie competition, in the production of wool. Having thus attempted to measure the capabilities of the various regions of our own country for the cheap production of this staple, it may be well to turn our eyes to the comparative advantages of other countries and nations—and to ask the question whether there is any danger to the domestic producer from *foreign competition*. This can be done but briefly and rapidly in the limits which I have assigned to myself.

It will not be necessary for the purposes of the present inquiry, to examine the climate, flora, &c., of all portions of the world. The wool-producing countries—those which have natural advantages to enable them to produce wool cheaply enough, and in sufficient quantities, to stand any chance in the general competition, are mainly embraced in a belt or region

[* It will be understood that the sign — before the number of degrees, indicates that it is that number of degrees *below Zero*, and the sign + used here, in the preceding Table, and in the subsequent paragraph, to avoid confusion, signifies *above Zero*. *Publisher.*]

† In the Report of the Fishing Creek Agricultural Society, of your State, 1843, the Committee actually complain of the variableness of the climate! Truly, 'we can only judge by comparison!'

‡ The mean winter temperature of North Cape in Norway, latitude 71°, is 23° 72—that of Fort Snelling, 15° 95—that of Council Bluffs, 24° 47—that of Rock Island, 26° 86.

about 15° in width, on each side of and at varying distances from the Equator. The variation corresponds with the variation of temperature; in other words, the wool zone is bounded by isothermal instead of latitudinal lines. Commencing on the eastern side of each continent, in the northern hemisphere, between about 30° and 45°, it bears northwardly, and strikes their eastern shores, say between 40° and 55°. In the southern hemisphere, I am not aware that the isothermal deviations, in the corresponding parallels, have been noted—nor are they important, so small, comparatively, is the latitudinal area of the surfaces included between them.

Independent of minor deviations everywhere exhibiting themselves in the isothermal lines, more important local exceptions exist in many places, owing to elevation, proximity of bodies of water, prevailing winds, &c. Thus, south of latitude 30° in North America, the elevations of the Cordilleras give the mild weather of the temperate, and even the rigors of the frozen zone; and the same is true of the Andes of South America—in Bolivia, Peru, Ecuador and New-Grenada—in the same latitudes, where, at the eastern foot of these declivities, the tropical sun burns up, as with fire, the verdure of the vast *llanos* of Brazil and Venezuela, and exhales death from the pestilent fens of Guiana, and the reptile-teeming marshes of the Amazon. The same exceptions exist on the Eastern Continent, wherever mountain chains rise to sufficient elvations to bring to bear this well known and uniform law for the depression of temperature, albeit in tropical or subtropical regions. The steady and mild climate of the Atlantic Ocean, and its continual and peculiar motion on the west of Europe, preventing the ice, which the north wind wafts down from the Arctic seas, from lodging itself, or even approaching* those shores, strongly influences the climates of the British Islands and Norway, rendering them more temperate than others many degrees farther south in the interior of Europe and Asia. Eastern Prussia, and Polish Russia, are rendered disproportionably cold by the prevailing wind, which sweeps without resistance from the bosom of the Arctic Ocean to the Carpathian Mountains: and the north-east wind, laden with the frosts of Siberia, and untempered by the southern winds, from which it is cut off by the lofty Altay Mountains, carries a cold under which men, nay whole caravans,† perish in Persia, in the same latitude with Northern Africa, and the confines of the burning Sahara.‡ The Caspian and Black Seas—Mounts Caucasus and Taurus prevent Asiatic Turkey, and Mount Hæmus, European Turkey—from experiencing similar cold. The same wind entering Europe, reduces the temperature of its eastern considerably below that of its western confines; and its effects are felt more or less westwardly, in proportion as its course is arrested by mountains. The climate of Silesia and Saxony is far colder and more mutable than than that of Bohemia, from which they are only separated by the Erzgebirge and Riesengebirge. In Northern European Russia, in Finland and the basin of the Dwina—in the same latitudes where Norway exhibits the

* Malte Brun's Geography—*Art.* Climate of Europe. † Sir Robert Kerr Porter.

‡ From the delightful Arabian Nights—from the not less delightful strains of Lalla Rookh—from a thousand other sources, remembered and unremembered—song, fiction and Oriental tale—Persia always rises before fancy's eye a realm and clime of beauty:

"—— deep myrrh-thickets blowing round
The stately cedar, tamarisks,
Thick roseries of scented thorn,
Tall orient shrubs, and obeliskS
Graven with emblems of the time,
In honor of the golden prime,
Of good Haroun Alraschid."

There are portions of Persia where the soil is rich and the climate delightful—but, as a whole, it is a bleak, sterile, unfruitful country—large portions of it covered with rugged mountains or saline deserts—with a climate remarkable for the rapidity and extent of its variations.

flora of Northern Germany—spirits freeze and quicksilver becomes malleable. But it is unnecessary to continue this enumeration.

Let us now take a rapid view of the wool-growing countries embraced in the specified zones. And we will first complete the description of our own continent.

Mexico—that portion of it north of latitude 30°—bears too close a resemblance to our Western Territories conterminous with it, to require separate notice.

But a small proportion of the great peninsula of South America is included between the 30th and 45th parallels of latitude, and admitting, what seems probable, that the contiguity of two great oceans would so affect the climate as to carry the northern line of the wool zone a little nearer to the Equator, this zone would still embrace but, say, two-thirds of Buenos Ayres, nearly all of Chili, the little State of Uraguay, a mere point of Brazil, and the north of Patagonia.

The growing of wool has already been commenced on the vast *pampas** of Buenos Ayres—though as yet to a but limited extent. In 1832, the export of wool to Great Britain was 32,052 arrobas ;† but the same year the import of English woolens considerably exceeded it in value. The United States Tariff on foreign wools costing 7 cents per pound or under, being then but 5 per cent. *ad valorem*, the importation of wool of that quality from the Argentine Republic‡ into our country in the fiscal year ending June 30, 1846, was 4,295,659 lbs., and of wool costing more than 7 cents (paying a duty of 30 per cent. *ad valorem*, and a specific duty of 3 cents per pound) the import was 43,831 lbs.‖

The *pampas* resemble the North American *prairies*, being plains covered with wild grasses, and entirely destitute of timber. The land is divided by the Government into estates a league square (5,760 acres,) and sold at 10 cents per acre. Until recently the pampas were depastured almost exclusively by horses and cattle, and so plenty and cheap were they, that they were frequently killed for their hides alone. The herdsmen and shepherds live in miserable huts, and temporary folds are formed of the trunks of peach-trees. Western or south-western winds called *pamperos* often sweep the country with destructive fury, and there are instances in which flocks of sheep have been forced by them into streams and have perished.

The inhabitants of the pampas are, on the north, the Gauchos—descendants of Spaniards—who, living in the saddle, and content to subsist on jerked beef and cold water—having few wants, and none which the *lasso* will not supply—lead a life of wild and roving liberty. Tribes of mounted Indians, wild, predatory, and constantly at war with the Gauchos, occupy the southern pampas.

The facilities for producing wool here closely resemble those of the North American prairies, though wood is wanting over much more extensive tracts. The price of land on the pampas is less, but they are more remote from markets, as there is little or no manufacturing done in South America. Besides the cost of transportation, wool must pay, before reaching market, the duties levied by some foreign nation. The duty in the United States, by the Tariff of 1846, is 30 per centum *ad valorem*, without regard to quality, thus discontinuing that great discrimination in favor of the coarse article, which allowed a large proportion of the wools of

* This word, like *llanos* in the Northern States of South America, and *prairies* in the North-Western United States, is applied to extensive plains. Those in the North of Chili are called *pampas del sacramento*.

† McCulloch's Commercial Dictionary. An arroba is 101¼ lbs. avoirdupois.

‡ Buenos Ayres is so known in all the official documents of the United States.

‖ Report of the Register of the Treasury, Dec., 1846.

Buenos Ayres, Africa, Turkey, &c., to enter our ports under a merely nominal duty. The present Tariff raised the duty on these wools to *six times* the former rate, *i. e.*, on wools costing 7 cents, from $3\frac{1}{2}$ mills to 2 cents and 1 mill per pound. This will make an important difference to the foreign grower and exporter. If these wools continue, as hitherto, to be imported in the grease and dirt, from which state they lose about half weight in being brought as clean as well washed United States wool, every pound of them so imported will actually pay a double duty, or 4 cents and 2 mills, half of this being paid for *dirt*. If, on the other hand, they are washed prior to exportation, a reduction of 50 per cent. in their weight will call for a corresponding advance in their price. Wool now costing 7 cents at Buenos Ayres or Smyrna, will cost 14 cents; and if this is exported into the United States, it must pay a duty of 30 per cent., or 4 cents and 2 mills per pound. It will be seen, therefore, that the lowest priced foreign wools cannot enter our country without paying about this duty (4 cents) per pound, unless under fraudulent invoices; and this, as has been already shown, is *half* the cost of producing wool throughout a region of the United States much greater in extent than all that portion of South America included within the wool-growing zone.

The English duty on wools costing less than 24 cents is 1 cent per pound; over 24 cents, 2 cents per pound. The French duty is 22 per cent. *ad valorem*, without regard to cost.

The security of life and property is far less in Buenos Ayres than in the United States; the character of the agricultural population less industrious, less skillful, and less methodical. Capitalists from other countries may, on account of the cheapness of the lands, make it profitable to purchase large *estancias*, and raise vast flocks of sheep; and this has already been done by a few Europeans. But the pampas are subject to the same general objections* with the North American prairies, and when the contagious diseases, adverted to in speaking of the latter, once obtain a footing on them, it is not difficult to predict how those diseases will be encountered by the wild and, so far as agricultural labor is concerned, indolent Gaucho. The difficulty of encountering them, with the best skill and industry, under such circumstances—of preventing their unlimited spread, constant return and frightful mortality, on plains without inclosures, where flocks have access to each other, or straggling sheep from one flock are liable, by every-day casualties, to be thrown among those of another flock —has been stated.

It is not improbable that while land remains so low, and the sheep healthy, the actual cost of production in Buenos Ayres will be somewhat less than in the United States; but taking all things into consideration, and looking to the future, I would sooner advise any one, even in an exclusively economical point of view, to purchase the cheap lands of our own Southern States for the objects of Sheep Husbandry, than any part of South America. With the present duty and the cost of transportation against the latter, there is no fear that it can undersell, in *our* markets, the produce of the former. The 7-cent South American wools, washed, will cost 14 cents, and washing will add about 1 cent a pound to the cost.† Add another cent for agent's commission, and also the U. S. duty, and the wool is brought to 20 cents a pound, independent of freight and insurance, which will carry it, I should think, to about two shillings. The United States producer can furnish wool of much better quality than the coarse South American article, at this price, and realize a high profit.

* Unless it be climatic ones. On this point I have no information.

† This will be attended with much trouble on large portions of the pampas, as on our prairies.

But is it said that the 7-cent South American wool sold in our markets in 1845 and 1846, was not all *coarse*—that much of it was actually of a superior quality? This is true. Many of the bales were *partly* made up of an article ranging with American Merino and Saxony wools. But there is little doubt that, to say the least of it, in *very many* such cases, if the invoice of the wool was not fraudulent, nominally, it was rendered so, in reality, by a previous fraud. The *modus operandi* is said to have been as follows: A sends his agent B to Buenos Ayres with instructions to purchase the best lots of wool and pay their market price; and he farther gives him secret instructions to re-sell these wools to C (a second agent) for 7 cents per pound, ostensibly in the ordinary course of business. The second agent C is subsequently sent out to buy, with no *information* of the mission of his predecessor; if he *suspect* the fraud, he has no *direct knowledge* of it, and having purchased wool for 7 cents which cost B 15 cents, he can invoice it at the former rate and support the invoice by his oath.

I have no *direct proof* of an instance of this species of fraud. The commonness of such transactions, however, was claimed to be a matter of perfect notoriety, by individuals who had investigated the subject. Allegations of this kind have appeared again and again in the most public manner, and I have yet to listen to the first denial of them, public or private. Fraudulent invoices are no new thing in our commercial history,* and the great discrimination made by the Tariff of 1842, in the duties on wool, offered the strongest temptations to them. The same kind of fraud may be still practiced, but the inducement to risk seizure for undervaluation is less where the diminution of duty is merely *pro rata* with the diminution of cost, and where getting the latter invoiced at as low a rate as 7 cents, is not followed, as before, by escape from a specific duty and a sudden descent of *five-sixths* in the *ad valorem* one.

I am free to confess, however, that it has always seemed to me that a determination to vigorously and faithfully discharge their duty in the premises, with a competent *practical knowledge of the quality of the article*, in the proper Custom-House officials, would always, in an unmanufactured staple, and one so readily classified and valued as wool, be a sufficient safeguard against fraudulent undervaluation, to any extent, in the invoice. They might perhaps be undervalued one or two cents on the pound, without making a case strong and obvious enough to justify appraisers in legalizing a seizure; but it is not for gains like these that perjuries would be ventured upon, or double agents and other expensive arrangements for the perpetration of more roundabout frauds, be found profitable.

Not having room, within the limits of this letter, to discuss the capabilities of the Old World to compete with us in wool growing, I will reserve that subject for my next.

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* If any one dreams they are, let him read a speech on the Tariff made by Mr. Buchanan in the U. S. Senate in 1842—another by Mr. Webster on *ad valorem* duties, made in the same body July 25, 1846, &c.

To Prevent Flies Teasing Horses.—Every merciful man who works a horse during the hot months, can promote its comfort by the use of the following simple shield against the teasing of flies. Take two or three handsfull of walnut leaves, upon which pour two or three quarts of cold water; let it infuse one night, and pour the whole, next morning, into a kettle, and boil for a quarter of an hour; when it is cold it is fit for use. Moisten a sponge with it, and before the horse goes out of the stable, let those parts which are most irritable be smeared over with the liquor. Try it.

AGRICULTURAL EDUCATION.

ACCUMULATING SIGNS IN FAVOR OF A GENERAL SYSTEM OF APPROPRIATE EDUCATION FOR AGRICULTURISTS—VOICE OF "THE CULTIVATOR."

We copy with inexpressible pleasure the following from the last Albany Cultivator. The deservedly wide circulation and influence of that journal will materially assist in the consummation of what every man of discernment must see is indispensably necessary to push the improvement of Agriculture to that pitch which other arts have reached, and reached only by bringing Science to bear on their progress and development. The people are rousing up to a sense of the "fixed fact" that while they are taxed some ten or twenty millions a year for the support of armies and navies, and for illustrations and instruction to advance military science, they have a right to insist on retaining or getting back a small modicum of the contributions out of their own pockets, for that kind of instruction which will improve them in the practice of that beneficent art which distributes its own abundance and prosperity to every other class of society. We shall be glad to follow in the wake of the Cultivator, and are not ashamed to cry "Help! help!" to every press in the Union, in such a cause.

The Cultivator is remarking on the Reports of Committees of the New-York Legislature at its late session, *pro and con*, on "several Petitions presented by the Farmers' Club of the American Institute, asking aid from the State for the establishment of an Agricultural School and Experimental Farm, to be placed under the care of the Institute":

> The Committee, however, recommend the study of Agriculture by means of books, in the Normal School, and in the academies and local institutions which are already established and endowed in all parts of the State.
>
> We do not propose at this time to discuss the principles set forth in either of these Reports, but will merely remark that it is gratifying to see that the agricultural interest is steadily and surely advancing to the position which it is entitled to hold, and from which it will, at no distant period, exercise its due influence on our legislative councils. The first and principal step toward securing this object is the proper education of the rising generation of agriculturists. We are confident that causes are now in operation which will ultimately produce the desired result. The language used by Mr. Beckwith, in closing his Report, happily expresses our own views:
>
> "We hope the day is not far distant when an uneducated farmer will be as rare a person as an uneducated lawyer, physician, or minister. We mean, too, by an education, something more than a knowledge of the mere routine of the farm and farming operations; we mean by the term, a mental training, by which the man who works amid the complicated arrangements of the subtle and refined agencies of Nature, will be able to understand those arrangements and give direction to the laws which control them."

As to "the Normal School," which we suppose to be referred to as "already established"—at Albany, we presume—we can only take time, for the moment, to say that we never experienced half as much pleasure as we did by a visit to it of our own seeking in company with Mr. Randall, now of Virginia. We were penetrated to the soul with the consciousness of the vast importance of the principle carried out in it; and we do not see, as we have before said, why it might not be so extended (in connection with a farm where principles should be illustrated and sustained by practice,) so as to throw a deeper infusion of agricultural science in the Common Schools of the State.

What would not $100,000 a year accomplish, applied to that object? It would

in ten years supply scientific teachers for at least one head school at the seat of Government of every county, if not in every district school; and why should not the great State of New-York demand that much, out of the $4,000,000 we shall be getting from the sale of the Public Lands? Look at the amount she contributes by her consumption of dutiable articles to the treasure of the Union.—Well, we have no time to dwell on the subject at which the coldest bosom must kindle with anxiety. We shall wait, hopeful and impatient, to hear what Governor WRIGHT will say on the subject.

ORCHARDS.

AN ORCHARD is an inclosure devoted to the cultivation of hardy fruit-trees. In it may be, as standards, apple-trees, most sorts of pears and plums, and all sorts of cherries, which four are the chief orchard fruits; but to have a complete orchard, also quinces, medlars, mulberries, service-trees, filberts, nuts, barberries, walnuts and chestnuts must be included. The latter two are particularly applicable for the boundaries of orchards, to screen the other trees from impetuous winds. A general orchard, composed of all the before-mentioned fruit trees, should consist of a double portion of apple-trees. With respect to the situation and aspect for an orchard, avoid very low, damp situations as much as the nature of the place will admit; for in very wet soils no fruit-trees will prosper, nor the fruit be fine; but a moderately low situation, free from copious wet, may be more eligible than an elevated ground, as being less exposed to tempestuous winds; though a situation having a small declivity is very desirable, especially if its aspect incline toward the east south-east, or south, which are rather more eligible than a westerly aspect; but a north aspect is the worst of all for an orchard, unless particularly compensated by the peculiar temperament or good quality of the soil. Any common field or pasture that produces good crops of corn, grass, or kitchen-garden vegetables, is suitable for an orchard; if it should prove of a loamy nature, it will be a particular advantage; any soil, however, of a good quality, not too light and dry, too heavy, stubborn, or wet, but of a medium nature, friable and open, with not less than one spade deep of good staple, will be proper.

PREPARATION OF THE GROUND.—The preparation of the ground for the reception of the trees, is by trenching one or two spades, as the soil will admit. And if in grass, turn the sward clean to the bottom of the trench, which will prove an excellent manure. The ground must be fenced securely against cattle, &c., either with a good ditch and hedge, or with a paling-fence, as may be most convenient.

METHOD OF PLANTING THE TREES.—The best season for planting all the sorts of fruit-trees is autumn, soon after the fall of the leaf, from about the latter end of October until December, though it may be performed any time in open weather, from October until March.

Let several varieties of each particular species be chosen that ripen their fruit at different times, from the earliest to the latest, according to the nature of the different sorts, that there may be a sufficient supply of every sort during their proper season; and if apples and pears, in particular, choose a much greater quantity of the autumnal and late-ripening kinds than the early sorts; but most of all of apples; for the summer-ripening fruit is of short duration, only proper for temporary service: but the later-ripening kinds keep sound some considerable time for autumn and winter use. The arrangement of the trees in the orchard must be in rows, each kind separate, at distances, according to the nature of growth of the different sorts; but for the larger-growing kinds, such as apples, pears, plums, cherries, &c., they should stand from twenty-five to thirty or forty feet every way asunder, though twenty-five or thirty feet at most is a reasonable distance for all these kinds. Each species and its varieties should generally be in rows by themselves, the better to suit their respective modes of growth. Stake the new-planted trees, to support them in their proper position, and secure them from being rocked to and fro by the wind, which would greatly retard their rooting afresh, placing two or three strong, tall stakes to each tree; but the most effectual method is to have three stakes to each, placed in a triangle, meeting at top near the head of the tree, wrapping a hay-band round that part of the stem to prevent its being barked by the stakes or tying; then tie the stakes at top close to the tree with some proper bandage, bringing it close about the stem and stakes together, over the hay-wrapping, so as to secure the tree firmly in an erect posture. If laid down in grass, no cattle should be turned in to graze at large, unless the stem of each tree is previously well secured with posts and railing, or wattled with thorn-bushes, especially in young orchards, otherwise they will bark the trees; nor should large cattle be turned into orchards where the branches of the trees are yet low and within their reach.

[Abercrombie.

EGGS AND POULTRY.

Among all nations, and throughout all grades of society, eggs have been a favorite food. But in our cities, and particularly in winter, they are sold at such prices that few families could afford to use them at all, and even those in easy circumstances consider them to be expensive for common use. There is no need of this. Every family, or nearly every family, can, with very little trouble, have eggs in plenty during the year; and of all the animals domesticated for the use of man, the common dunghill fowl is capable of yielding the greatest profit to the owner. In the month of November I put apart eleven hens and a cock, and gave them a small chamber in the wood-house, defended from storms, with an opening to the south. Then food, water and lime were placed on shelves convenient for them, with nests and chalk nest-eggs in plenty. These hens continued to lay eggs through the winter. From these eleven hens I received an average of six eggs daily during winter; and whenever any one of them was disposed to sit, namely, as soon as she began to cluck, she was separated from the others by a grated partition, and her apartment darkened. These cluckers were well attended and well fed. They could see and partly associate through the grates with the other fowls, and as soon as any one of these prisoners began to sing, she was liberated, and would very soon lay eggs. It is a pleasant thing to feed and tend a bevy of laying hens. They may be trained so as to follow the children, and will lay in a box. Egg-shells contain lime, and when in winter the earth is bound in frost, or covered with snow, if lime be not provided for them they will not lay; or if they do, the eggs of necessity must be without shells. Old rubbish lime, from chimneys and old buildings, is proper for them, and only need to be broken. They will often attempt to swallow pieces of lime and plaster as large as walnuts. The singing hen will certainly lay eggs if she find all things agreeable to her; but the hen is so much a prude—as watchful as a weasel and fastidious as a hypocrite—she must, she will have secrecy and mystery about her nest. All eyes but her own must be averted. Follow or watch her, and she will forsake her nest and stop laying. She is best pleased with a box covered at the top, with an aperture for light, and a side door by which she can escape unseen. A farmer may keep 100 fowls in the barn, may suffer them to trample on and destroy his mows of grain, and have fewer eggs than the cottager who keeps a dozen, provides secret nests, chalk nest-eggs, pounded bricks, plenty of corn or other grain, water and gravel for them, and takes care that his hens be not disturbed about their nests. Three chalk eggs in a nest are better than one, and large eggs please them most. I have smiled to see them fondle round and lay in a nest of geese eggs. Pullets will begin to lay early in life, when nests and eggs are plenty, and when others are chuckling around them. A dozen dunghill fowls, shut up away from other means of obtaining food, will require something more than a quart of corn a day. I think fifteen bushels a year a fair allowance for them; and after they have become habituated to find at all times a plenty in their little manger, they take but a few kernels at a time, except just before going to roost, when they will take nearly a spoonfull in their crops; but just so sure as their provisions come to them scanted or irregularly, so sure will they raven up a whole cropfull at a time and stop laying. A dozen fowls well attended will furnish a family with more than two thousand eggs a year; and one hundred full grown chickens for the fall and winter stores. The expense of feeding a dozen fowls will not amount to more than eight bushels of grain. They may be kept in cities as well as in the country, and will do as well shut up the year round as to run at large. A grated room well lighted, ten feet by five, partitioned from a stable or outhouse, is sufficient for the dozen fowls, with their roosting, nests and feeding-troughs. In the spring of the year five or six hens will hatch at a time, and the fifty or sixty chickens may be given to one hen. Two hens will take care of one hundred chickens well enough until they begin to climb their little stick roosts. They then should be separated from the hens entirely. I have often kept the chickens when young in my garden. They keep the May-bugs and other insects from the vines. In case of confining fowls in summer, it should be remembered that a ground floor should be chosen; or it would be just as well to set in their pen boxes of well-dried, pulverized earth, for them to wallow in during warm weather. Their pens should be kept clean. [Scot. Ref. Gaz.

Wheat.—One hundred parts of wheat grown on a soil manured with cow-dung, afforded only 11·95 parts of gluten, and 62.34 parts of starch; while the grain grown on land manured with human urine gave 35·1 of gluten, or nearly three times the quantity.

THE BAROMETER.

THE PRACTICAL USE OF THE BAROMETER TO FARMERS AND OTHERS, WITH RULES FOR PREDICTING THE WEATHER.

THE proper use of the Barometer as a means of judging of the weather is not generally known, or its great practical value would be more extensively appreciated, more especially by farmers. It is only necessary to be well acquainted with the nature of its indications to form a tolerably good, and mostly a correct, estimate of the impending weather. For this purpose, it is here proposed to embody the most approved rules relative to the Barometer; and it may be remarked that if all persons, affected in any way by changes in the weather, will but consult their Barometer daily, they will soon be sensible of the great advantages derivable from such practice.

It should be first be well understood that the principal criterion of the kind of weather to be expected is the relative motion of the mercury in the tube, and that its absolute hight is only of secondary importance, when atmospherical changes are to be anticipated. The words engraved on the register-plate should not be much regarded, as they cannot always be relied upon to correspond with the state of the weather, and in fact, would show different indications at the top and bottom of a lofty house; but much greater dependence may be placed in the rising and falling of the mercury. For this reason the words are more deserving of notice when the mercury has just moved from "Changeable" upward or downward.

The absolute hight of the mercury is a safe prognostic when it is unusually high or low, and the following observations upon it may frequently be found to be extremely serviceable:

1. All appearances being the same, the higher the Barometer is, the more likely is the weather to be fair. When the Barometer is high, it will be found that very dark and dense clouds pass completely over, and that there is very little probability of immediate rain.

2. When the Barometer is low, it sometimes rains almost without any appearance of clouds; and though the sky may seem to promise fair weather, it may be depended upon that the appearance will not continue long: the face of the sky changes very suddenly on such occasions.

Also, when the Barometer continues low, there is seldom much rain, though a fair day is very rare; the general character of the weather at such times is short, heavy, and sudden showers, with squalls of wind from the W., N. W. or S. W.

3. The Barometer is highest of all during a long frost, with a N. E. wind; and it is lowest of all during a thaw following a long frost and accompanied by a S. W. wind.

4. In all places nearly on a level with the sea, rain may be expected when the mercury falls below 30 inches.

To judge rightly of the changes to be expected in the weather, we should especially ascertain whether the mercury is actually rising or falling. This will be always seen by regularly adjusting the index of the Barometer; or, we may observe—1. If the surface of the mercury be convex, standing higher in the middle of the tube than at the sides, it indicates the rising; if the surface be concave, it is falling; and if it appear level, the mercury is stationary. 2. If, on shaking or rapping the Barometer, the mercury ascends higher than it stood before, it indicates the rising; but if it descends, it indicates the falling.

The following rules have been laid down and amply confirmed by long-continued experience, and may be generally relied upon:

1. The rising of the quicksilver generally presages fair weather; the falling generally indicates rain, snow, and if the fall be great, high winds and storms.

2. When bad weather *quickly* succeeds the falling of the mercury, it will not be of long continuance. Similarly, when fair weather *soon* follows the rise of the quicksilver, we must not calculate on its continuance for any length of time.

3. On the contrary, if, in bad weather, the mercury rises considerably, and continues in an advancing state for two or three days before the fair weather sets in, we may expect a continuance of fair weather. And if, in clear weather, the mercury fall remarkably for two or three days together before the rain sets in, it is then highly probable that it will be succeeded by much rain, and perhaps high winds.

4. In winter, the rising indicates frost; and in frosty weather, if the mercury falls three or four divisions, there will certainly follow a thaw; but if it rises in a continued frost, it will always be accompanied with snow.

5. In hot weather, the sudden falling of the mercury portends thunder.

6. If the earth continues moist, and water stands in hollow places, no trust should be put in the clearest sky.

Of all persons, the farmer and the sailor are those who can generally, from constant observation, form the best judgment of the atmospheric indications of weather; but while to the latter the Barometer is of the utmost importance in indicating that a sudden change is at hand; to the former it will be found equally useful, if he is a constant observer of it, by showing him, pretty accurately, whether or not any particular change of weather is likely to be of some duration.

SCIENTIFIC AGRICULTURE—BUYING LAND.

"You know very well," said Science, "how your neighbor, old Mr. Stubborn, went into the next State to buy a farm. The owner knew what the farm was, and advertised it in spring time, when he expected damp weather. I advised Peter to take me with him to view the strata of rocks below, and to analyze the soil on the surface; to see how it laid for draining, and what aspect it presented to the atmosphere. I told him I could save him my expenses many times over. But Peter scorned my advice—he thought he had worked more land than I had, and was as good a judge of land as any man in the States; and he set off, muttering something about 'not letting book-worms make money out of him.' He walked carefully over the farm—it looked green and flourishing, and not swampy, even in that damp, wet weather. He was delighted with it, and gave forty dollars an acre for over three hundred acres. He paid his twelve thousand dollars and took possession. But in the summer time as I passed that way, I found that so-much-praised farm almost burnt up with drouth, and its vegetation drooping and panting for moisture which the soil could not supply! Peter had bought a light, sandy soil, lying upon what we call, geologically, a coal formation, with a pretty decided slope eastward. I took a little bit of the soil, and analyzed it, and showed what it contained. In one hundred parts there were about eighty-three of lime, three of oxide of iron, one of potash, and one part of phosphoric and carbonic acids, and four parts of vegetable and organic matter. 'Now,' I said, 'the soil will be beautifully productive in wet weather, but will be parched in dry weather.'

"'Ah,' he said, 'that was how I was taken in—I saw it in a wet spring season.'

"'If,' I rejoined, 'you had taken me with you, I would have taken a handfull of this soil from various parts of the farm, and would have told you exactly what it contained, as I do now. I would have told you that sand, which predominates here, cannot retain moisture, which flies off; nevertheless, I would have told you that in certain positions the soil might be made fruitful, if it laid upon a faithful geological formation, and with a moist atmospheric aspect. I should then have examined the geological strata here, and have told you that it was on a coal formation, consisting of beds of limestone and blue shale, near the surface, which generally underlays the worst lands—and sloping so rapidly toward the east, the moisture would drain away through the sands and down the slope, while the east wind, the most drying and piercing of all winds, would blow with its keen, drouthy breath *into* the soil, driving out that moisture which had not drained away; that in summer your crops would be impoverished, and in long drouths probably would not grow at all. I could have shown you all this, and you would have known that the farm was of small value, and saved your money. Your ignorance has caused you to throw away as much as you have made in many years of hard work.'" [Sat. Courier.

HARVESTING-MACHINE.—A correspondent, writing from Michigan to the New-York Evangelist, says: "A field of sixty acres was harvested in two days, as follows: A machine was drawn into the field by sixteen horses, guided by as many boys as necessary. On the front of the machine a man was stationed to adjust the forks and circular knives to the hight of the wheat, which was readily thrown back into the machine. No more was seen of it till another man in the rear part of the machine was observed tying up well-filled sacks of pure grain, in perfect order for the flouring-mill. This huge machine harvested and bagged three bushels of the best wheat in a minute."

BARRELS.—A machine has been invented, and is now in operation at New-Haven, and and also in New-York, for dressing barrel-staves. It will make 7,000 such staves, or 4,000 hogshead staves, in ten hours.

SCRAPS.

ORIGIN OF FEEDING WITH OIL-CAKES.—The nutritive properties of oil-cake, which now forms such a prominent ingredient in the fattening diet of our finest sheep and oxen, and which till about 150 years ago was used as a manure on corn lands only, are said to have been discovered in the following singular manner: A farmer residing in the neighborhood of Chester, having been tempted by a favorable fair to purchase 40 more sheep than he could conveniently pasture through the winter, prevailed upon a neighboring tanner who also rented a little farm, to take them as out-door winter boarders. The sheep were accordingly sent, and turned into a ten-acre field, and when they had fed it down, thence into a twenty-acre piece, which the tanner had just dressed, by way of experiment, with oil-cake. In this piece the sheep lay about two months without having been seen by the farmer or the tanner. The animals were found to have eaten the manure, and had got very fat. Hence the origin of feeding on oil-cakes. [British Farmers' Almanac.

A NEW KIND OF CHEESE.—An esteemed friend, in whose *recipes* we have great confidence, has kindly furnished us with the following for making cheese: Boil good white potatoes, and when cold, peel and mash them till not a lump remains. To five pounds thus prepard, add a pint and a half of *sour* milk, and as much salt as may be deemed necessary to season the mass. Having worked it well let it be carfully covered from two to four days, according to the state of the weather; then work again, make the cheeses the size you like, *and then dry them in the shade.* After they have become sufficiently dry, place them in pots or pans, and let them remain a fortnight or more. In this way cheese of a most excellent quality may be made, and, what is of no small consequence, it can be kept for years without the slightest deterioration from the effects of age, provided it be kept dry. A friend who has had the pleasure of eating cheese prepared in this manner, speaks of it in high terms. [Maine Farmer.

HOPS.—The most ancient known account of the cultivation of hops has been discovered in France. Among the records of that Kingdom there is a patent of donation so far back as the reign of King Pepin, in which mention is made of "*humolariæ*," which doubtless meant the hop-garden; and in 822, we find that the Abbot of Corby exonerated the millers within his district from all service regarding hops. From about that period the culture of this plant spread over Germany, and was even introduced into Sweden; but it is remarkable that so late as the 13th century, it was unknown in Italy, which we presume could scarcely have been the case had it been in use among the Romans.

[British Farmers' Almanac.

FLAX.—A crop of flax exhausts the soil, as, being pulled, it leaves no stubble and roots to convey to the land the carbonic acid gas in the atmosphere; but if the steep-water and fibre were returned to the land, it might be converted into an ameliorating crop. [Brit. Farm. Alm.

CATTLE SALE.—The following sale of Short-Horn cattle was made at Chilicothe on the 29th June, by Mr. Geo. Renick:

Cows.		*Heifers, three years old.*	
Donna Maria	$95	Bloom	$45
Lady Paley	87	Josephine	71
Poppy	82	Lucy	80
Red Rose	111	Twin	52
Rose of Sharon	97	Nate	35
Evening Star	120	Lady	80
Virginia	110	Dairy	55
Scioto	110	Venus	53
Maria	52	Beauty	75
Thames	120	Ten yearling heifers sold for the following prices: $36, 41, 31, 30, 32, 50, 36, 30, 31, 43.	
Miss Marshall	125		
Sandusky	60		
Duchess	81		
Paint	73		
Laura	43	*Bulls.*	
Lily	45	Prince Charles, three years old	105
Flora	125	Albion, do	60
Daisy	40	Farmer, two years old	30
Blossom	54	Red Rover, one yr old	46
Scippo	90	Five bull-calves sold for $36, 54, 59, 54, 30.	
Blanch	100		
Blink	90		

The foregoing animals were all thoroughbred, and most of them of highly improved pedigree. A number of grade cows, heifers, and calves, were included in the sale, and brought satisfactory prices.

The number of bidders present was respectable, though not as great as we expected to have seen, nor were the prices at which the cattle sold generally as high as we supposed stock of such pedigrees would bring; though much allowance must be made for the times. We believe Mr. Renick is not at all disappointed with the result of the sale. He offered his whole herd, only reserving the right of six bids. He only bought five animals, and there were none bid in for him, though a number were bought by relations of his name, who are also amateurs of fine cattle.

LIME IN PLANTING TREES.—In setting, we usually put a small quantity of lime in the hole—about half a peck to a tree—mixing it thoroughly with the mould, in order that it may be easily accessible to the roots, which ramify in every direction in quest of food. An English publication says that an extensive plantation of trees has been formed within a few years, without the loss of a single tree, and has been effected simply by putting a small quantity of lime in the hole before depositing the tree. Four bushels are said to be amply sufficient for an acre. The effect of the lime is "to push on the growth of the plant in the first precarious state." There seems to have existed, at first, an apprehension that liming the tree would force it on prematurely, but this apprehension experience has demonstrated to have been perfectly groundless.

NIGHTSOIL.—The business of collecting urine and nightsoil employs an immense number of persons in China, who place tubs in every house in cities for receiving the urine of the inmates, which vessels are removed daily with as much care as our farmers remove the litter from the stables.

To make Egg Pone.—Beat until light one egg; add a pint of milk, half a tea-spoonfull of salt, half a table-spoonfull of lard, and one pint of corn-meal. Stir until perfectly smooth; grease well the pan, and bake three-quarters of an hour. *Corn* bread requires much stronger heat than *wheat*.

This same mixture baked on a griddle gives us the batter-cakes, with the addition of more milk, making the mixture thin, to bake which successfully, the griddle must be *hot*; grease it and put a spoonfull in a cake.

Effect of various Manures on Wheat.—Wheat grown in a field manured with cow-dung yielded in 100 parts only 12 parts of gluten; whereas, 100 parts grown on land manured with human urine yielded 35 parts, arising from the different quantities of ammonia contained in the manures. The following Table exhibits the various substances contained in wheat on which nitrate of soda was used, and on which nitrate was not used:

	Used.	*Not used.*
Bran	25	24
Gluten	23¼	19
Starch	49½	55½
Albumen	1¼	¾
Extract, loss, and water	1	¾
Total	100	100

Potash.—The following Table contains a statement of the quantity of potash contained in 10,000 parts of some of the common trees and plants:

Oak	15	Poplar	7
Elm	39	Thistle	55
Beech	12	Fern	62
Vine	55	Cowthistle	196
Wormwood	730		
Vetches	275		
Beans	200		
Fumitary	790		

Lime.—The following method of using lime stands so high in our estimation that we repeat it every year:

Break the stones small before being put into the kiln to be burnt, and not larger than a goose's egg; lay them in a hot state on the land, which should be in a half-wrought condition; spread out the lime shells very evenly; the subsequent operations of plowing and harrowing, not less than twice performed, will cover and distribute the lime, and the land will be benefited by the moist heat and damp exhalations that will be evolved during the dissolution. This is by far the most preferable mode of using lime that is yet known. [British Farmers' Almanac.

English Government Prices for Provisions.—The Government of Great Britain, in October, 1846, contracted for the following provisions at the annexed prices: say 18,000 tierces of pork at the average price of £7 11s. 2d. per tierce of 400 lbs., equal to 36,000 barrels of 200 lbs.—reduced to our money, say $4 80 per pound sterling, is at par $18 12 per barrel of 200 lbs. Also for 8,000 tierces of beef at the average price of £7 3s. 3½d. per tierce of 400 lbs., equal to 16,000 barrels of 200 lbs.—equal, in our money, to $17 19 per bbl. A tierce of beef or pork is 400 lbs. net of meat; a pound sterling is $4 80 at the Custom-House.

"King of Vermont"—A Merino ram owned by General Rawson Harmon, of Wheatland, N. Y. Said buck is a pure descendant of the Spanish Merinos imported in 1812. He was bred by S. W. Jewett, Weybridge, Vt., and got by his buck "*Fortune*." He dropped in April, 1845; in December, same year, tupped over 80 ewes; was wintered on hay and roots; was washed and sheared by Mr. Harmon in June last; his fleece weighed nine pounds! and the buck over 100 pounds; he will now weigh 130 pounds. General Harmon has a flock of over one hundred pure Merinos.

The Horse.—I will state a few things that I have learned, and they may be of benefit to your readers. A horse that is driven on hard roads is liable to get stiff in the joints. In 1833 I had an animal which after driving 3 or 4 days, got quite lame. An old Baltimore teamster told me to wash the mare's legs in a tolerably salt brine, which was done, accordingly, three times a day for the balance of the journey. The stiffness disappeared in a few days, and I drove the mare 1,400 miles afterward, and there was no more trouble on that account. What pleased me most was, the mare had a very poor foot to hold a shoe, when I started. It was very brittle and hard. It would break out when a nail was put in. But it grew together at every shoeing. A blacksmith in New-England remarked to me that her foot had a singular appearance; where he pared it was soft and tough. I account for it in this way; salt will attract moisture from the atmosphere, which keeps the foot moist all the time; and salt has nearly the same effect that grease has on a foot or a piece of timber. The drippings from salt on a floor if continued long, cannot be got off; the wood becomes moist and tough, and so with a horse's foot. After washing the legs, turn up the horse's foot, clean the bottom, pour the hollow full of brine and hold for a few minutes to soak the bottom. The practice of rasping the foot all over to toughen it is abominable. [Farmer and Gardener.

Quantities of Seed suited for a Cottage Garden.—Allowing for loss or accident in garden seeds, we believe the following quantities for sowing a common cottage garden to be nearly correct:

One pint of peas will sow fourteen yards of drill; one pint of beans will sow twenty-two yards of drill; one ounce of onion-seed will sow ten square yards; one-half ounce of leek-seed will sow six square yards; one ounce of carrot-seed will sow ten square yards; one ounce of parsnip-seed will sow twelve square yards; one-half ounce of cabbage-seed will sow three or four square yards.

Greasing Carriage-Wheels.—The best composition that can be prepared to relieve carriage-wheels and machinery from friction, is composed of hog's lard, wheat-flour, and black lead (plumbago.) The lard is to be melted over a gentle fire, and the other ingredients—equal weight—may be added, till the composition is brought to a consistency of common paste, without raising the heat near the boiling point. One trial of the paste will satisfy any one of its superior utility. [Exchange paper.

☞ Unusually large breadths of corn have been planted this spring, and our supply of *Poudrette* fell greatly behind the demand. We regret that so many should be disappointed and unable to obtain it. We began the season with a large stock on hand, but it was exhausted toward the close of last month. We are now, however, prepared to meet any calls. The poudrette has been heretofore considerably used, and to good purpose, to put around the corn-hills just previous to the first harrowing or plowing, when it can be covered from the sun.

THE PERIODS OF PREGNANCY IN DIFFERENT ANIMALS.

Kinds of Animals.	Proper time for reproduction.	Period of the power of reproduction.	Number of females for one male.	The most favorable season for copulation.	Period of gestation and incubation.		
					Shortest period.	Mean period.	Longest period.
	Yrs. Mos.	Years.			Days.	Days.	Days.
Mare	4 0	10 to 12		May	322	347	419
Stallion	5 0	12 to 15	20 to 30				
Cow	3 0	10		July	240	283	321
Bull	3 0	5	30 to 40				
Ewe	2 0	6			146	154	161
Tup	2 0	7	40 to 50	Nov.			
Sow	1 0	6		March	109	115	143
Boar	1 0	6	6 to 10				
She-goat	2 0	6		Nov.	150	156	163
He-goat	2 0	5	20 to 40				
She-ass	4 0	10 to 12		May	365	380	391
Male-ass	5 0	12 to 15					
She-buffalo					281	308	335
Bitch	2 0	8 to 9		Feb.	55	60	63
Dog	2 0	8 to 9					
Doe rabbit	0 6	5 to 6		Nov.	20	28	35
Buck rabbit	0 6	5 to 6	30				
Cock	0 6	5 to 6					
Turkey sitting on eggs of—							
Hen					17	24	28
Duck					24	27	30
Turkey					24	26	30
Hen sitting on eggs of—							
Duck					24	30	34
Hen		3 to 5					
Duck					28	30	32
Goose					27	30	33
Pigeon					16	18	20
She-cat	1 0	5 to 6			48	50	56
He-cat	1 0	9 to 10	5 to 6				

ANALYSIS OF WHEAT.

The following Table exhibits the results of Fourcroy and Vauquelin's analysis of different kinds of Wheat:

Names.	Moisture.	Gluten.	Starch.	Sugar.	Gum.
Gross flour of wheat	10	10·96	71·49	4·72	3·32
Flour of maslin, wheat, and rye	6	9·80	75·50	4·22	3·28
Gross flour of Odessa, hard wheat	12	14·55	56·50	8·48	4·90
Do. soft wheat	10	12·00	62·00	7·36	5·80
Do. second quality	8	12·10	70·84	4·90	4·60
Do. seconds	12	7·30	72·00	5·42	3·30
Flour of the Parisian bakers	10	10·20	72·80	4·20	2·80
Do. second quality	8	10·30	61·78	4·80	3·60
Do. third quality	12	9·02	71·20	4·80	4·60

FAT AND MUSCLE PRODUCED FROM AN ACRE.

Substances.	Produce per acre.	Weight of grain per bushel.	Weight of gluten, albumen, and casein.	Weight of starch, gum, sugar and fat.	Weight of water per acre.
Field beans	25 bush.	64 lbs.	450 lbs.	672 lbs.	256 lbs.
Peas	25 ..	66 ..	380 ..	845 ..	208 ..
Oats	50 ..	42 ..	290 ..	1,168 ..	336 ..
Hay	3 tons.		480 ..	2,790 ..	752 ..
Potatoes	12 ..		600 ..	3,330 ..	20,250 ..
Carrots	25 ..		1,120 ..	5,800 ..	47,600 ..
Turnips	30 ..		800 ..	6,700 ..	56,950 ..
Wheat straw	3,000 lbs.		40 ..	940 ..	450 ..
Oat straw	2,700 ..		36 ..	970 ..	324 ..
Barley straw	2,100 ..		28 ..	646 ..	252 ..

TRENCHING.

Trenching is one of the readiest modes in the gardener's power for renovating his soil. The process is thus conducted:

"From the end of the piece of ground where it is intended to begin, take out a trench two spades deep and twenty inches wide, and wheel the earth to the opposite end, to fill up and finish the last ridge. Measure off the width of another trench, then stretch the line and mark it out with the spade. Proceed in this way until the whole of the ridges are outlined, after which begin at one end and fill up the bottom of the first trench with the surface or 'top spit' of the second, then take the bottom 'spit' of the latter, and throw it in such a way over the other as to form an elevated, sharp-pointed ridge. By this means a portion of fresh soil is annually brought on the surface to the place of that which the crop of the past season may have in some measure exhausted." [Gard. Chron.

Bastard-Trenching is thus performed:

"Open a trench two feet and a half or a yard wide, one full spit, and the shoveling deep, and wheel the soil from it to where it is intended to finish the piece; then put in the dung, and dig it in with the bottom spit in the trench; then fill up this trench with the top spit, &c., of the second, treating it in like manner, and so on. The advantages of this plan of working the soil are, that the good soil is retained at top—an important consideration where the subsoil is poor or bad,—the bottom soil is enriched and loosened for the penetration and nourishment of the roots; and, allowing them to descend deeper, they are not so liable to suffer from drouth in summer; strong soil is rendered capable of absorbing more moisture, and yet remains drier at the surface by the water passing down more rapidly to the subsoil, and it insures a thorough shifting of the soil." [Gard. Chron.

In all trenching, whether one, two or more spades deep, always, previous to digging, put the top of each trench two or three inches deep or more, with all weeds and other litter, at the bottom of the open one, which not only makes clean digging, and increases the depth of loose soil, but all weeds and their seeds are regularly buried at such a depth that the weeds themselves will rot, and their seeds cannot vegetate.

PRICES CURRENT.

[*Corrected, July* 21, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	4 87½	@— —
Pearls, 1st sort, '46		6 12½	@— —
BEESWAX—American Yellow		— —	@— 25
CANDLES—Mould, Tallow	℔ lb.	— 10½	@— 12
Sperm		— 30	@— 31
COTTON—From	℔ lb.	— 10½	@— 14
COTTON BAGGING—American		— —	@— —
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 11
Sheetings		— 6½	@— 15
FEATHERS—American, live		— 27	@— 30
FLAX—American		— 7½	@— 8½
FLOUR & MEAL—Genesee	℔ bbl.	5 25	@— —
Troy		— —	@— —
Michigan		5 —	@ 5 12½
Ohio, Flat Hoop		5 —	@ 5 12½
Ohio, Round Hoop		— —	@— —
Ohio, via New-Orleans		— —	@— —
Pennsylvania		— —	@— —
Brandywine		— —	@— —
Georgetown		5 50	@ 5 75
Baltimore City Mills		— —	@— —
Richmond City Mills		— —	@— —
Richmond Country		5 —	@ 5 25
Alexandria, Petersburg, &c.		5 —	@ 5 25
Rye Flour		3 75	@— —
Corn Meal, Western and Jersey		2 75	@ 3 25
Corn Meal, Brandywine	pun.	— —	@— —
GRAIN—Wheat, White	℔ bush.	1 15	@ 1 25
Wheat, Red and mixed		1 —	@ 1 10
Rye, Northern		— 77	@— 78
Corn, Jersey and Northern yel		— 60	@— 62
Corn, Southern, yellow		— —	@— —
Corn, Western, yellow		— 58	@— 60
Oats, River and Canal		— 38	@— 40
Oats, Jersey		— —	@— —
HAY—North River in bales,	℔100 lb	— 40	@— 45
HEMP—American, dew-rotted	ton	100	@110 —
" " water-rotted		175	@200 —
HOPS—1st sort 1846		— 10	@— 12
IRON—American Pig, No. 1		25	@32 50
" Common		25	@27 50
LIME—Thomaston	℔ bbl.	— 65	@— 70
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35 —	@ 40—
Boards, Eastern Pine		— —	@— —
Boards, Albany Pine	℔ pce.	— 12	@— 21
Plank, Georgia Y. Pine.	℔ M. ft.	27 50	@— —

Staves, White Oak, pipe,	℔ M.	50 —	@— —
Staves, White Oak, hhd		40 —	@— —
Staves, White Oak, bbl		30 —	@— —
Staves, Red Oak, hhd		24 —	@28 —
Hoops		20 —	@30 —
Scantling, Eastern		16 25	@22 50
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 30
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 28	@— 32
Shingles	℔ bunch	1 75	@ 2 25
Shingles, Cedar, 3 feet, 1st quality		26 —	@30 —
Shingles, Cedar, 3 feet, 2d quality		24 —	@28 —
Shingles, Cedar, 2 feet, 1st quality		18 —	@22 —
Shingles, Cedar, 2 feet, 2d quality		16 —	@20 —
Shingles, Cypress, 2 feet		15 —	@18 —
Shingles, Company		35 —	@38 —
MUSTARD—American		— —	@— —
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 14
Cut, 4d to 40d		— 4¼	@— 4½
PLASTER PARIS—	℔ ton	2 25	@ 2 50
PROVISIONS—Beef, Mess,	℔ bbl.	13 —	@13 50
Beef, Prime		9 25	@ 9 50
Pork, Mess, Ohio, new		14 75	@14 87½
Pork, Prime, Ohio, new		12 —	@— —
Lard, Ohio	℔ lb.	— 9¼	@— 10½
Hams, Pickled		— 7½	@— 8½
Shoulders, Pickled		— 6	@— 6¼
Sides, Pickled		— —	@— —
Beef, Smoked	℔ lb.	— 11	@— —
Butter, Orange County Dairy		— 18¾	@— —
Butter, Western Dairy		— 13	@— 15
Butter, Grease		— —	@— —
Cheese, in casks and boxes		— 6	@— 7½
SEEDS—Clover	℔ lb.	— 6	@— 7
Timothy	℔ tierce	12 —	@16 —
Flax, Rough		9 50	@— —
SOAP—N. York, Brown	℔ lb.	— 3½	@— 5½
TALLOW—American Rendered		— 9	@— 9¼
TOBACCO—Virginia	@ lb.	— 3	@— 7½
North Carolina		— —	@— —
Kentucky and Missouri		— 3	@— 7½
WOOL—Am. Saxony, Fleece,	℔ lb.	— 40	@— 45
American Full Blood Merino		— 35	@— 38
American ½ and ¾ Merino		— 30	@— 34
American Native and ¼ Merino		— 26	@— 28
Superfine, Pulled Country		— 32	@— 34

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REMARKS ON THINGS IN GENERAL.....No. II.

BY A RAMBLER IN THE MOUNTAINS OF VIRGINIA,

With Notes by the Editor of The Farmers' Library, to whom they were addressed.

WARM SPRINGS, Va., July 18, 1847.

DESCRIPTION OF MONTPELIER.

YOUR readers were conducted in my last, if they had the patience to follow me, to *Montpelier*, the residence of Doctor P. Thornton, in Rappahannock County, Virginia; and there might any valetudinarian—or well man either—be well content to dwell, if in pursuit only of a climate as salubrious as the far-famed Montpellier in France—without having any occasion or desire for the drugs, verdigris, perfumed waters and apothecaries for which the latter is distinguished as well as for its healthy air. During three weeks of delightful sojourn—realizing all that tradition tells us of the generous hospitality and good living of old Virginia in her greatest prosperity—while you were being fried, roasted and stewed, with the mercury rising well up toward 100, it rarely got up to 80 at Montpelier—falling always at night below the mark that inclines you to pull up at least one blanket before daylight.

As to the Establishment "*per se*," and in connection with the estate of 1,000 acres attached to it, all under view; and the surrounding scenery, bounded on all sides, within a few miles, by an irregular, undulating mountain outline, it is but a just tribute to the taste that selected and improved it as a place of residence, to say that in my recent rambles from the Crescent City on the Mississippi to the "Hights of Abraham," on the St. Lawrence, I have seen no establishment that combined so much pleasantness and natural beauty of climate and scenery.

A better idea may be had of the site itself by supposing a natural mound of about two acres on its summit, sloping away on all sides to ten or twelve at its base, situate in the center of a lake of oblong figure—covering altogether an intervale of about two thousand acres of flat land. As the water forced its way and escaped through a fissure in the mountains, this mound doubtless showed itself, at first a small island in its midst—and finally, when the water had subsided, leaving a bold stream only to traverse the Valley on its way to the Rappahannock, there stood this beautiful mound, fitted by Nature for the residence of the proprietor of the whole intervale. That proprietor was the father of the present owner, and of a numerous family—his possessions here embraced ten thousand acres in a body, whereof this estate is all that remains in their hands; sharing in this respect the common fate of the large domains of the old wealthy and high-bred families of Virginia, at the close of the Revolution. The mountain sides in view of Montpelier are covered with trees of almost all the kinds that lend to our au-

tumnal forests the charms of all colors interspersed.* Even now may be distinguished the deep, dark green of the Chestnut-Oak and Hickory, from the paler shades of the Dogwood and Locust; while here and there these mountain slopes are dotted to their very summits with small cultivated farms, as if at once to enliven the prospect and to show that Nature has here thrown up no hight inaccessible to the spirit of human industry.

In thus casting behind a "long, lingering look" on the beauties of a private establishment, there has been, it may be confessed, something of an inward purpose to reproach, impliedly, that all-engrossing spirit of accumulation which leads our countrymen, characteristically, as it has been alleged, to regard nothing but the "almighty dollar" as worthy of any concern. Hence it is that we see, all along our public roads, so many dwellings exposed to the unmitigated heat of the sun, with scarcely a tree or shrub for shade or ornament; while most of the few attempts that are made at embellishment violate at once every principle of Art and all the rules of Nature. Savages may have their strong local attachments to their native forests and hunting-grounds; but these are founded in sensual associations, for in these have they found the means of appeasing their animal appetites. Here have been the theatres on which have been indulged the kindred passions for the chase and for war; but when was Indian or African ever known to take any pleasure in the mere quiet beauties of Nature as they commend themselves to imaginations refined by moral culture? When were they ever seen to evince any pleasurable emotion at the sight of the most extended prospect of mountain and valley—or to lift up their hands with rapture at the limitless expanse of the Ocean itself! No, Sir, the perception of the picturesque and the sublime is the fine fruit of intellectual cultivation—and he whose soul is insensible to the beauties and the grandeur of Nature may well be suspected of a like insensibility to the finer feelings and duties of social and domestic life. On the other hand, a taste for rural ornament may serve to assuage the cares of adversity, and has even been thrown in, with a judgment true to nature, as a relieving virtue to save the worst of outlaws from unmitigated abhorrence. Thus with the Pirate Lambro, there was

> "A taste seen in the choice of his abode,
> A love of music, and of scenes sublime;
> A pleasure in the gentle stream that flowed
> Past him in crystal; and a joy in flowers,
> Bedewed his spirit in his calmer hours."

Is it not, then, Mr. Editor, time for the community to cultivate among our young people, more generally and systematically, as you have strongly urged, a taste for, and knowledge of the principles of Rural Architecture and embellishment of their homesteads, if we would aspire, as a nation, to any of the graces of Civilization and the softer amenities that should characterize a refined and polished people? Alas! that in this age of Christianity and of boasted Progress, in this our republican country, the Government should be deemed incompetent to give or provide for instruction of the rising generation in anything but the—art of destruction of their fellow-men! And shame to say! the landholders of the United States—the single class whose labor produces more of the national wealth than all others united—seem either content to have it so, or have not the spirit or understanding to redress themselves; nor will they have until they have the discernment and independence to be represented, in much greater proportion, by cultivated men of their own class animated by that perfect sympathy which is only the fruit of perfect identity of condition and pursuit.

Were I to suggest any addition to an Arboretum so handsome and well arranged as that at Montpelier—where *ars colare artem* seems to have been the

* Our correspondent adverts here to a remarkable feature in the character of these mountains. Their tops are covered with a stunted and not very various growth, while the Valley immediately beneath throws up timber fitted for any purpose. We gathered, some days since, on one of the spurs near the foot of the Warm-Springs mountain, within a very small space, branches of more than twenty trees, viz: the Chestnut, Chestnut-Oak, White-Oak, Red-Oak, Black-Oak, Hickory, Linn, Gum, Elm, Cucumber-tree, Sassafras, Iron-wood, Wild Cherry, Locust, Sugar-Maple, Walnut, Wild Plum, Dogwood, and two kinds of Pine. *Ed. Farm. Lib.*]

guiding motto—it would be to add the Sugar-Maple; our native broad-leafed Elm, with its long and graceful branches; and the Hacmatac, or Tamarac, the most beautiful of the Pine family, to which it belongs. These, intermingled with the native Oak, the Spruce and Pine, the Cedar and other pines and evergreens, the Poplar, Locust, Mulberry, Hickory and Walnut already there, in all their majesty and beauty, would be sufficient both for shade and variety.

Leaving Montpelier, the road to the Valley of Shenandoah leads through "Thornton's Gap" in the Blue Ridge, to Luray, the Capital of Page County, (formed out of parts of Rockingham and Shenandoah, in 1801,) intersecting the Macadamized turnpikes leading from Winchester to Staunton at Newmarket in Shenandoah.

HUSBANDRY SUITED TO THE COUNTRY THROUGH WHICH WE HAVE PASSED.

Looking back now to the *Agriculture* of the counties east of the Blue Ridge, it appears to me that as far as the inhabitants of the region from Fredericksburg to Thornton's Gap depend upon the cultivation of *grain* with *slave labor*—or with any labor—as a reliable source of income, and with any expectation of even checking their lands in the progress of exhaustion, they are too surely doomed to disappointment, if not to ruin, with which, alas! in this, more than in any other pursuit, men are apt to be overtaken without suspecting its approach or knowing precisely whence it comes. How should they know who enter into no calculations, and keep no accounts?—as though "where ignorance is bliss 'twere folly to be wise." And so it would be if—the bliss would only continue! My impression, from personal observation and the best information I could get, (and making the proper allowance for the overestimates generally made by the most candid farmers as to their own settlements,) is that the average produce in Wheat does not come up to *seven bushels to the acre*, and 15 or 20 of Corn, through the whole region here referred to—between Fredericksburg and Thornton's Gap, and until you get into Page County on the Shenandoah. The corn is probably nearly all consumed in these counties for the subsistence of the inhabitants and domestic animals—most of it by that most expensive of all machines, the *horse*, which here is used exclusively for farming purposes, against the plainest rules of economy that would suggest, to a much greater extent, at least, the use of the longer-lived and less delicate mule, and the coarser-feeding, patient, and at last *edible* ox. This system leaves for an exclusively grain farm very little except the *wheat*. Deducting from that what must be reserved for seed, and making a fair charge for expense of cultivation, harvesting, threshing and transportation to Fredericksburg—and there will remain, at the utmost, not more than three bushels clear per acre, or, say, $300 for the produce of 100 acres. Thus, to my eye, the want of adequate physical force for thorough tillage, and for making at home and applying the manures so necessary, after all, for carrying land up to and maintaining it in any thing like its full capacity—the absence and dearness of lime—the face of the country—the great expense of transporting gypsum from tide-water and of sending the grain crops to market—the badness of the roads at the season of comparative leisure—and above all the evident natural congeniality of the soil to the growth of the various grasses, far beyond what would be yielded of them by lands of the same low capacity for producing grain on the tide-water: all and every consideration seem to suggest that the *rearing of stock*—horses, and more especially mules, cattle and sheep—is the true policy and business pointed out by Nature, and the change in its circumstances wrought by steam-power for the landholders generally in the region here designated. The clover—especially white clover—orchard-grass, timothy and red-top flourish almost everywhere, even over all the hills, and to all appearance naturally. Even the steep mountain-sides, when cleared and the brush burned, throw up excellent pasturage for sheep. It is, in fact, Sir, impossible to look at this fine, healthy, undulating country—with its numberless and never-failing springs of the purest water, capable of being so conducted as to convert so many hill-sides into water-meadows, and yet where not a drop of stagnant water offends any sense—thus to see fields that, by all comparison with lands of similar appearance elsewhere, would bring nothing but poverty grass, yet here covered with white clover and other good herbage: it is, I say, impossible to look—however transiently—at such a district, and to note its water-power so dispersed and abundant for driving all sorts of

machinery, without feeling it was designed by the God of Nature to become, in process of time—the fullness of which is now—a wool-growing and wool-manufacturing country. Its numerous cascades seem audibly to invoke the genius and enterprise of such men as Ellicott and Lawrence and Pratt to turn them to useful account; but here have they gone for ages as still they go—leaping from rock to rock, descending mile after mile, as much unheeded by man as by the deer that roams or the wolf that prowls in the neighboring mountains.

"The Southerner," at Richmond, a vigorous and indomitable advocate of a self-sustaining policy for the State—urging the development and use of her own rich resources for her own benefit—computes the cost of the imported articles from the North annually for each county in the Southern States at $80,000. That would make for Northern manufactures, for Fauquier, Culpeper and Rappahannock $240,000 a year, or more than $6 a head for every man, woman, and child—black and white. But I need not dwell on the adaptation of this reason to Sheep Husbandry, and especially to its fitness for raising the *finest* Wool, for which I see fifty cents have been lately offered and refused at Rochester, New-York. I would not dare attempt to poach on *this* manor of your very able and accomplished correspondent, Mr. Randall of that State, to whom the most intelligent southern cultivators I have met with acknowledge themselves to be greatly indebted for his comprehensive and skillful illustrations of that subject.

There are no two companions more congenial—none that lounge through the world together in greater harmony, than Ignorance and Indolence. What the one says, the other will swear to, and they have united in the dogma that this climate is unsuited to the growth of fine Wool—and that as for Manufactories, they must ever be excluded for want of capital and suitable operatives. I will not stop here to discuss either of these convenient excuses, my purpose being merely to give a sort of running, bird's-eye view of the agricultural economy and resources as I go along; but from this purpose permit me so far to depart as to make, in reference to the appropriateness of this high and dry climate for growing the finest Wool, a single quotation from an elaborate examination into the industrial resources of England, the greatest wool manufacturing power in the world—particularly as to her capability to grow fine Wool. It will be seen how, nevertheless, her climate—almost the opposite to that of Virginia—cuts her off from self-supply. The reader will not fail to note how remarkable is the absence in Western Virginia of the very impediments that preclude the growth of this great staple of British Industry:

"There are two kinds of woolen goods which are formed by different modes of manufacture; and these, again, are founded on essential differences in the structure of wool. *Worsted* goods are formed of wool, the fabrics of which are long, and have little twist. In such goods the web is formed only as the web of cotton or linen goods, by the opposition of the fibres or threads alternately crossing and parallel. But in what are properly woolen goods, as in broadcloths, after the web has been so formed, it is subjected to a violent beating in the tucking or fulling mill, during which the cloth shrinks very much in length and breadth, but thickens, and the individual threads of the web so mix in with each other that they cannot be distinguished until it is much worn and becomes threadbare. Now for such goods a different kind of wool must be taken than for worsted goods. The fabric must be short and more twisted. These varieties of wool are known as short and long stapled. The cause of this difference is that each fibre of wool consists of a series of joints, and at each joint there are a set of projections, like the barb of a fish-hook. In long-stapled wool these joints are few and very weak—in short-stapled wool they are numerous and strong. If a handfull of the latter be worked in the hands, the fibres will gradually interlace, and by these barbs catching into each other will lock into a kind of web, quite independent of spinning and weaving: they will form felt. It is in this way that the bodies of hats are made, as all furs possess the same property. Hence the making of cloth requires the spinning and weaving of the web in the first instance, and the subsequent partial felting of the fibres in the tucking or fulling mill.

"I notice these particulars, as the climate and vegetation of a country exercise remarkable influence on the staple and structure of the wool which the sheep produce, and thus, finally, on the description of manufactured goods. In *moist*, cold climates—such as that of the British Islands—the natural wool of the adult sheep is universally long-stapled and unfit for felting, while in dry climates with hot summers the wool is short-stapled and felts strongly. The wool produced not merely in Ireland, but in England also, is thus exclusively adapted for the worsted trade; and that of Ireland being of an excellent quality of fibre, is much sought after for the finer kinds of worsted. For woolen cloths and similar

goods the wool is imported from the Continent. The great plains of the East of Europe support vast flocks of sheep, whence we derive our Silesian and Saxon wool. The dry plains of South Australia are also favorable to the growth of fibre—and hence has been created, within a few years, a branch of trade most important to that Colony. It has been an object with English wool-growers and landed proprietors to produce this felting-wool in England, and thus get rid of the necessity of purchasing abroad; but it has been found impossible, after the most expensive experiments in importing sheep of particular flocks. It has been found that in two or three generations, even of the pure breed, the influence of the climate and food totally changed the character of the wool, and brought it to the *same quality as that of the native animals.* With regard to woolens, this country [Ireland], like England, must import wool, and hence will be under the same conditions of access to raw materials as the sister kingdom."

In these statements of Doctor Kane we have the utmost confidence. They are derived, doubtless, from the best sources, and put forth with that care and discrimination which characterize him as one of the ablest writers on National Industry that has appeared in any age or country. It will be recollected by your readers that Von Thaër—in my judgment the most philosophical, profound and comprehensive of all writers on Agriculture—speaks of the adaptation of high, dry pastures for sheep, and estimates the expense of pasturage and keep of sheep as compared with cows as ten to one.

In mechanical industry, the cost of the motive-power of machinery bears but a small proportion to the other elements of cost of the manufactured article, but that of water-power is not put down at more than one-tenth that of steam. "An eminent manufacturer in Leeds," says Doctor Kane, "said to me that water-power is cheaper than steam at the mouth of the coal-pit"—and hence, wherever water-power is to be had, it is used in preference to steam; and it is alleged, moreover, that cotton spun by water-power bears and always has borne a higher price than cotton spun by steam-power.

After all, suppose the legislator for Virginia to desire to know the extent of the water-power of the State as connected with questions of Industry, and where would he get the information? But raise a question of one-tenth as much importance in any way connected with *War*, and Congress would appropriate hundreds of thousands for the survey. It would be quite easy to get a survey and map of any wild Indian or Mexican country, but quite impossible to get one dollar for laying down the mountains and water courses and power within the bosom of the old States.

Why, at all events, should not this noble old State, instead of persisting forever in the application of her slave labor (the best of which is culled and sent away) to objects for which neither that species of labor nor their climate nor locality are adapted—why should she not appropriate for the increase of her own resources her own peculiar advantages, even to the perfect manufacture of the wool, as Georgia is beginning to avail herself of the possession, in like manner, on the spot, of the great staple of another manufacture. Slaves must all—big and little, young and old—be maintained throughout the year, while the chief staple in these counties—wheat—demands their labor not more than one aggregate month in the year. Let them, then, betake themselves to cheese-making and to rearing stock and fattening it for market, where that can be done profitably. These pursuits call comparatively for little labor—and with wool-growing as an incident of this system they should combine the woolen manufacture, which offers employment for operatives of all ages and sizes, day in and day out, throughout the year, so that every consumer may be also, to some extent, a producer. As to the spirit that is beginning to animate even her more southern neighbors, let her sons read the following from the *Charleston Mercury:*

"We have been informed that a Cotton Manufactory at Columbus, Ga., has within the last three years cleared one hundred and fifty per cent. upon its capital, and that its net profits during the last twelve months amounted to 65 per cent; and other factories have been doing a very successful business. We trust the day is rapidly approaching when a large proportion of the cotton crop of the South will be exported in the shape of cotton cloth."

With similar signs of enterprise and improvements on every side—on the East and the West, the North and the South—will this old "Mother of States" never wake up to avail herself of the bounteous offerings of Nature for her own support and aggrandizement?

HOW FAR SHOULD WE GO IN ENCOURAGEMENT OF DOMESTIC MANUFACTURES?

Do not, Sir, understand me as being willing to carry the practice of self-supply to the anti-social extreme that would shut up every man in his own shell, and lead to a state of barbarism by placing every individual in a state of isolation. Independence is a great blessing—but the greatest may be too dearly bought. I would not have every farmer construct a vat to tan his own leather, because it would cost more than it would come to; but I would have him send his hides to be tanned, in preference, by the tanner nearest home, who would be most apt to take his meat or his butter in part payment, provided he would supply his leather at a fair price. Our country—nay, this State—is a world in itself in extent and in capacity for producing all the necessaries and most of the luxuries of life. With her capacity to produce provisions of all sorts—with her deposits of iron, of lead, of coal, of salt—her supplies of timber and of water-power—for how little need she go out of the State, and is it not self-evident that the more there are at other employments within her borders, the better and the more convenient is the market for the products of the agriculturist? The great obstacle, after all, is not so much in want of capital—not so much in any peculiar cast or prejudice of politics—but for the want of early, and proper, and suitable instruction of her young men in branches of knowledge which are indispensable to the perception and bringing into activity of great industrial resources. If she had possessed her schools of Art and Industry—such as they have in France—would she not have been ashamed to send copper ore, as I see she did some weeks since, from Prince William County all the way to Massachusetts, to have it smelted and valued?

RESOURCES OF PAGE COUNTY.

But to proceed on our journey. On reaching Luray, the county town of Page, we came—as they say in the East—to "quite another guess sort of country." The valley which forms this county is traversed through its whole extent by the waters of the Shenandoah, and is justly considered as one of the most fertile in that celebrated Valley—still retaining the reputation in that respect, which it justly acquired in its early settlement, by comparison with older sections—a reputation which will not now stand the test, in comparison with newer settlements in more western States, or even with the Valley of the Kanawha, in this. In Page County some gentlemen of undoubted intelligence and candor gave me the average product at 15 bushels of Wheat—and Corn in proportion; but 12 would probably be nearer the mark, though in this County the proportion of absolutely poor land is very small. Its husbandry is mixed, between grazing and grain; and altogether it is one of the most fertile and independent counties in the States. It contains 374 square miles, or 243,100 acres—and if you will afford me the room, it would be no more than fair to quote in its favor the statement of Martin, that the land in this County "is generally of the very best quality of limestone valley land;—considered in relation to its agricultural advantages it is, with the exception of Jefferson, the richest County of its size in the State." You may judge of its water-power from the fact that there are, or were in it in 1835, more than 100 mills, saw, merchant, and grist: besides six *carding* machines; three oil-mills; six hemp-mills; ten tan-yards; one blast-furnace for smelting and two forges for making bar-iron. "Vast quantities of iron ore are found in every part of the County; copper, lead and magnesia are also found in considerable quantities."—With all these advantages it is difficult to account for the apparent decrease of population since 1830, except on the ground of some great oversight or mistake. Martin states it at 8,327 in 1830, and Darby gives it a population of only 6,194 in 1840—of which 216 were Free Colored, and 781 Slaves. Its access to market is by wagons to Winchester and across the Blue Ridge through Thornton's Gap to Fredericksburg—except when the Shenandoah is in boatable condition in early spring. The hire for negroes is, for men, from $50 to $75 a year, and women $30—and for white laborers $7 to $10 a month; and the price of land from $30 to $50, and even $60, when well improved. The nature of the soil is much the same in this as in other parts of the Shenandoah Valley; its less undulating surface, and the higher price of land, seem to have given it the direction it has taken—more to grain-growing and to fattening cattle brought down from the western mountains—and invite less to Sheep Husbandry.

RUFFNER'S CAVE, IN PAGE COUNTY.

Martin, in his account of Western Virginia, has given a very interesting description of "the wonders of Cave-Hill," among other "curiosities"—closing with a romantic one of the interior apartments of *Ruffner's Cave*—situate about a mile from the road leading from Thornton's Gap to Newmarket, and said to be little inferior in extent and beauty to the celebrated "Weir's Cave," of which you gave, if I mistake not, a diagram and description, in your old American Farmer, some 28 years since. As you would not like to yield room for the glowing description given by one of the party of original explorers of this remarkable cavern, I will only trouble your readers with the following account of its first discovery:

"A Mr. Ruffner, who was nearly as much celebrated for deeds of sylvan prowess as the renowned Putnam, in passing this Cave, some thirty years ago, conceived the bold and hazardous design of entering it alone. He accordingly prepared himself a flambeau of pine, and placed his rifle across the mouth, to indicate, in case of accident, to his friends, if they should happen to see it, that he was in the Cave. He descended, but soon fell and put out his light—and, as might have been expected, was soon bewildered and lost in its labyrinth of passages. It happened that some of his friends in passing the Cave discovered his gun, and rightly concluding that he had gone into it, they procured lights, entered in search of him, found and brought him out, after his having been there forty-eight hours. This brave fellow was among the pioneers who were foremost in exploring and settling our western frontier; and was at last killed by the Indians, after having performed deeds of valor and daring prowess which would have done honor to the character of a hero."

DESCRIPTION OF NEWMARKET—ITS ANTI-SHADE TREES LAW.

Leaving Luray after breakfast, some 14 miles bring you to Newmarket; and as it has been set down in the common parlance of Gazetteers as "beautifully situated," and as, furthermore, its resources and destiny are committed to the corporate management of the Fathers of the City, I must describe it as I found it, if only to record one thing in their municipal polity which, with your love of trees, you will agree almost deserves corporeal punishment. Know, then, that Newmarket stands in the center of a valley where the rays of the sun concentrate between the mountains. The whole town consists of two parallel rows of wooden houses, with few exceptions two stories high—extending for a quarter of a mile on each side of a dusty turnpike. Well! the first impulse on being set down at the City Tavern in the noontide sun in dog-days is to inquire, Where in the name of comfort are your shade-trees? for not one is to be seen to relieve the glare of the sun's reflection from the houses and the broad Macadamized road—whereupon the plea of justification put in is that the wise Aldermen have strictly forbidden, in Newmarket, any man's performance of one of the three duties which it is appointed unto every man, as it is said, to perform in his lifetime—for here the *planting of trees is interdicted by law*—and for fear of what, does the reader suppose? Why for fear, in case of fire, that the trees might catch and spread the flame!

It were almost a pity but the wise framers of this prohibitory statute against trees could be prohibited themselves from all attempts to perform one of the other three cardinal duties of man, until this barbarous law should be repealed.—But to

THE AGRICULTURE OF THE VALLEY OF THE SHENANDOAH—ESPECIALLY THE LIMESTONE PORTION OF IT.

You may get a general idea of the scope of my inquiries into the agricultural resources, habits and productiveness of this famous Valley of the Shenandoah by the following Answers, with which I was promptly favored by one of its most distinguished citizens. The answers are made, as he informs me, by a scientific and practical farmer, who would be admitted as high and competent authority could I feel at liberty to give his name:—other among the most intelligent citizens in Winchester and the vicinity authorize a general approval of the statement:

1st. "At what price, generally, could the farmer of your County burn or purchase Lime—I mean the unslaked, one of which makes two slaked?"

Answer. About 12½ cents per bushel.

2d. "Is it much used as a fertilizer, on lime or free stone land, and with what effect?"

Answer. Lime is but little used on limestone land, and where used, the effect has not been very decided, probably from its imperfect application—to a very small extent. On free stone and slate lands it is used with more marked benefit.

3d. "Is gypsum or plaster much used—in what way applied, and in what quantity—and with what effect, in public opinion, in its action on the crop or the land?"

Answer. It is extensively used, generally by itself, and at the rate of a bushel to the acre—sometimes in combination with leached ashes in the proportion of 1 to 2. It is applied, most commonly, to clover; sometimes to corn in the hill—generally at planting; some farmers harrow it in with wheat with good effect: its benefit is most decidedly perceived on clover—the great restorer and fertilizer of our lands. Some farmers have supposed that after a period of use it fails to produce its general effect; others seem to think that—from its stimulating property or other cause—it, in many cases, leaves the soil either exhausted, or less adapted to successful cropping of wheat. This opinion, however, is but limited; for plaster and clover are the main substitutes, in the County, for direct manure in maintaining the fertility of our lands. Gypsum is now abundant and cheap—costing at the Railroad dépôt from four to five dollars per ton.

4th. "Have your lands generally increased or diminished, within the last twenty or thirty years, in the average produce of wheat and corn—and what is the average through the County?"

Answer. It would be safe to say they had generally increased; the portions, however, of the County then in fresher cultivation have doubtless diminished in many cases in their products. There is a perceptible improvement in farming of late years. The limestone portion of Frederick County embraces from 60,000 to 65,000 acres; its average of wheat may be set down at ten bushels, and of corn about five barrels to the acre.

5th. "What is the price of your best lands—middling-sized and large farms?"

Answer. A farm of 250 to 300 acres of good limestone land, reasonably improved and convenient to market, will command from $35 to $50 per acre. Larger farms are at a rate from 15 to 20 per cent. less.

6th. "Does or does not the Valley suffer more than formerly with drouth—and is there not a general falling-off in the volume and constancy of your springs and spring branches?"

Answer. From the clearing of woodland, and the more general tillage of the County, it is reasonable to suppose that the water coming from the clouds is more rapidly carried off to the large streams: and it may be that some of the smaller springs may have disappeared, and, to a small extent, the spring branches may have consequently diminished—but there is scarcely any farm called a "dry farm" now that was not in the same condition thirty years ago; and our springs, almost without exception, still retain their constancy and remarkable copiousness.

7th. "Are oxen used to any considerable extent in the plow, and might they not be more generally substituted for horses in that sort of farm labor?"

Answer. Oxen are not used at all for plowing—they are considered too slow and not adapted to the broken character of our soil in many places, nor to the kind of hands they would generally have to be managed by. They are used for drudge work on a great many farms. In general farm-work the mule is somewhat used in addition to the horse—the main reliance of our farmer as the beast of labor.

8th. "Is the horse-rake in general use?"

Answer. It is, in making hay, and frequently with great benefit in the harvest field—immediately following the hands, in many cases.

9th. "What wheat-thresher is most used and approved?"

Answer. The six-horse spike-machine of various forms and constructions—recently a threshing and cleaning machine (combined) seems to attract much attention and is getting into use.

10th. "Are your farmers getting in the way of cutting their wheat by machinery—and if not, why have machines been used and found wanting—and in what?"

Answer. Our farmers use reaping-machines to a very limited extent—nor are they likely to employ them much. The not unfrequent limestone ledges and other inequalities of our lands seem to forbid the complete benefit of the reaping-machine, unless accompanied in places with the cradle. The defect in those introduced is mainly found in their not completely cutting the grain unless standing very favorably—but especially in not forming the sheaf regularly and in fair arrangement.

11th. "What are the usual wages given for white farm hands—what is the average allowance in provisions, especially meat to working negro hands, day by day, through the year?"

Answer. White hands are not to be obtained with readiness—their wages are from $7 to $10 per month, with board. The wages of negro men by the year are from $50 to $75—the allowance in meat, when particularly distributed, which is rare, may be from one-half to one pound—but with an abundance of vegetables the experience of one of our farmers has found the first quantity to be sufficient.

Thus have we the opinion of one of the most judicious farmers resident within.

the famous limestone region of Virginia, that one of the most fertile Counties of the State does not average more than ten bushels of wheat to the acre. How strongly am I thus warranted in claiming for the whole Valley not more than twelve—might I not have named ten, and not exceeding seven for the counties eastward, between the Blue Ridge and Fredericksburg? Yet farther to show that I have probably over rather than under rated either of these portions of the State, it may be mentioned, as to another popular district, of more than a hundred miles in length between Lynchburg and Richmond on the line of the James River Canal, a valley of very unequal width, that a gentleman of much more than ordinary intelligence, Mr. B., resident there, rates the average produce of wheat at *not exceeding six bushels to the acre*. In England the estimate is that the average of the whole kingdom has been brought from 17 bushels, in 1821, to 26 bushels, in 1846, and this is ascribed chiefly to a better knowledge of the *principles of Agriculture!*—yet how few there are in the whole State of Virginia who read your FARMERS' LIBRARY—in the comprehensive scope of which are embraced all the discoveries and improvements in Agriculture that take place not only in England but in all countries? How can men learn without *thinking? without inquiry?*

GRAZING CATTLE

Is pursued as a business much more extensively in the Valley than in the Counties lying east of the Blue Ridge; many farmers fatten there for market from 50 to 100 head. The system is to buy stock-cattle, the rearing of which, in the more western counties, forms a separate department of that great branch of industry, and the impression with old farmers is that the quality of *stock*-cattle has deteriorated of late years; 25 or 30 years ago they still showed the fine effect of a cross from a stock called Miller's breed, which had been as many years before imported and probably were of the best Short-Horns. That blood has been frittered away until it has run out, and the breeders of stock-cattle seem not to have the sagacity and energy (without which men should not expect to thrive in any business) to purchase Short-Horn bulls in Kentucky or elsewhere. As these breeders of stock-cattle often find their market as low down as Baltimore County in Maryland, they should make it a rule to keep themselves supplied with bulls from the noble herd of *Patterson's Devons*, near Sykesville, on the railroad between Frederick and Baltimore. There are none better than his in England, and, as a herd, perhaps not one equal to it in number. These cattle are of a genuine natural race, of middle size, very well put together, carrying perhaps more beef of the finest quality *to the acre* than any other breed—and of all others, except the Scotch Highland cattle, (which unfortunately have not been tried in our country) best adapted to the management and pastures which prevail in the Western Counties of Virginia and the Eastern Counties of Tennessee—while Kentucky and Ohio will do right to adhere to the Short-Horns as long as they possess such luxuriant pastures, and corn in such abundance for fattening them. But it may be doubted whether they would do so well in a region where—as west of the swarm of springs—they subsist their cattle, in a great measure, when the ground is covered with snow, on the *boughs of the sugar-maple*, which are felled in great numbers for that purpose. Knowing the capacity and inestimable value of the ox, as he is fondled and followed by the hardy farmer of New-England, I would not desire, Mr. Editor of The Farmers' Library, a better business—with a foundation of Patterson's Devons to go upon in East Tennessee and Western Virginia—than to raise *oxen*, to be broken and trained under the management of a Yankee teamster, and sent down under handsome yokes to be sold annually in the tide-water Counties of Maryland and Virginia—large, cherry-red oxen, that do their duty with unfailing accuracy, and by a sort of passionless instinct that is better than sense, since it *never mistakes an order*—such oxen, in a word, as readily command in the Eastern States $100 per span. And why should they not, if you compare them with the horse, or even the mule?—the horse eating his hay and half bushel of oats, and dying at an average of ten, of the colic or the botts—the ox laboring day in and day out through the year, on grass or good hay, and at the same age giving you 800 pounds of good beef for your harness tub, without any cost but a year's holiday. Thus, instead of a total loss of your capital, the ox gives it back to you at the moment you take his life. I am aware of the objection urged by my friends at Winchester, as to their

slow motion, and have not time to discuss that point. For a dissertation that covers the whole ground of gearing, breaking and training, and their capacity and relative value as compared with the horse, I refer you to Stabler's valuable Prize Essay in the old American Farmer. As to the objection to the heat of the climate I can only say, as far as that applies to the high Counties of Virginia, that I have been rambling among them most agreeably since the first week in June up to this, 26th of July, and have but once seen the mercury as high as 82° —while the papers tell us it has been in Boston repeatedly above 90°—and nothing has more frequently occurred to me than how it would do a true farmer's heart good to see a Worcester County, Massachusetts, farmer, following one of Moore & Ruggles's, or Prouty & Mears's plows in the limestone Valley of Shenandoah, or along the stony mountain sides of Rappahannock, with his span of oxen, such as I have seen *back* a heavy cart up hill, steeper than that which leads directly up to the Warm Springs House, with *four thousand weight of stone in it!*—But I have been insensibly led away again from the line of personal observation prescribed for these desultory remarks, and must return to the subject of *grazing in the Valley.* The "stock" cattle are driven down the Valley from September to November, and are carried through the winter on wheat-straw and hay, and fattened on grass in summer. The average price of these stock-cattle last autumn was $14 a head. Where they are designed to be sold in late spring or early summer, they are "*mealed*" through the winter, and always "salted" twice a week. They are expected to average 500 or more, and the general calculation with the grazier is to sell at from 75 to 100 per cent. advance on first cost; but to this first cost is to be added labor and interest on the value of the land, &c. Here is, undoubtedly, a much-neglected, nay, altogether unutilized branch of agricultural economy in the tide-water counties of Maryland and Virginia, where thousands of cattle might be reared on the marshes, and carried through the winter on wheat-straw and corn-fodder; and if not ultimately fattened they might, at three and four years old, be gathered into droves in early autumn, and driven up for sale as stock-cattle into Counties nearer to market, and where men have the enterprise to improve their lands and provide the means of fattening. I have no hesitation in believing that the tide-water Counties of Maryland might add one hundred thousand dollars of clear income to their present resources from the present source alone. But because the result in a single case might not justify the attempt, the amount not warranting the trouble, they have not the enterprise to *form a system.* But how can men be expected to *combine,* collectively, their judgment and resources, who have not been educated and trained *individually* to think, and to turn over and examine all the elements of success in their profession? True, for example, it might be no object for a single farmer, with no matter how much waste marsh land in summer, and wheat-straw and corn-fodder in winter, to add—as all such farmers might do—3 or 4 or 8 or 10 to the number of his young stock-cattle, because he might not expect a uniform and remunerating market at home, and so few would not bear driving to a distant one; but how easy to unite with his neighbors to make up, in the month of September, a drove of one or two hundred!—whereby, almost without a dollar's cost, that much enough to pay his taxes, or the blacksmith's or the grocer's bill at least, might be added to his income? But how much more exhilarating to attend a party caucus, and there listen to the slang-whanging of party demagogues, than to be studying the principles, and investigating the resources and materials of Agricultural Industry—its literature, and the natural history that naturally belongs to it! How much more congenial for Indolence to sit waiting for some lucky turn of fortune—to indulge in dreams of being some day poked into some sinecure office, than to be troubled with acquiring the various knowledge that appertains properly to the art of Agriculture, lifting it out of the mire, and elevating it from a mere laborious, toilsome drudgery to the condition of a high, noble, intellectual and accomplished pursuit?—Such men, though themselves without a spark of the right sort of ambition, cannot realize the truth that

> Cato farming more independent feels
> Than Cæsar with the Senate at his heels."

Though indignation always overcomes me when I think of the convenient and stupid doctrine of those who maintain that farmers have nothing to learn from books, (as if *knowledge* and experience ceased to be knowledge and experience

merely from being put in print,) yet you must allow me, as I go along, to make "practical application" of what I see—as in this case, it seemed not out of place, in speaking of the sources of supply of stock-cattle, to turn aside for a moment to inquire of the landholders of the tide-water and marshy river-shore districts of Maryland and Virginia, whether they too might not profitably supply thousands for the grazing districts of their States, and Pennsylvania? And now a word as to the

SYSTEM OF HIRING, FEEDING AND CLOTHING NEGRO LABOR.

The system of hiring, feeding and clothing colored people, as I was informed by the very respectable and intelligent landlord at Newmarket, is to collect at that place—for that County—on the first of January, those to be hired, and to put them up to the highest bidder, for the ensuing year, or to bargain more generally by individual arrangement. The person hiring gives his bond with good security to pay the hire at the end of the year, and the universal custom is to give two good summer suits, and one winter suit of clothing and to pay the tax-bill, which is assessed by the Court, so much for each slave of both sexes over sixteen years—also a tax called the "head tax," on all white men. The tax on white men, levied for county purposes, is from 75 cents to $1 25. In this portion of Virginia and all west of the Blue Ridge, the system of *allowance* of meat to blacks is not generally practiced. Their labor and diet may be essentially identical with that of white laborers. On the eastern side of the Blue Ridge, the system of allowancing is more generally kept up, and there the measure of meat is from 2 to 3½ pounds, with as much corn-meal or bread as they can eat, and in many cases a small allowance of salt-fish—herrings—of which they are fond, as the next most acceptable thing after *fat middling*, esteemed not much the worse for being a little *rusty:* reminding one in this respect of an estimable friend of ours, now dead—H. M. M. of Baltimore—who, constitutionally amiable and polite as he was gallant and accomplished, on paying a morning visit, the lady of the house evincing much distress at the bad behavior of a smoky chimney, observed, "I pray you, madam, don't be annoyed on my account. I rather *like a little smoke!*" I feel perfectly satisfied, after particular inquiry, founded, as may be truly added, in an habitual and unaffected solicitude on this point, that on the score of diet and labor, and substantial clothing and kind treatment, of the colored people in Maryland and Virginia, humanity has nothing to allege against their owners, with doubtless a few most reprehensible exceptions, as there are black sheep to be found in the best flocks. At Montpelier they all have well and richly cooked meals of corn-bread and meat, with vegetables and skimmed milk every day; each young negro child getting its regular allowance of a pint of fresh milk, that would make a full quart if it were to undergo the process of augmentation to which the fresh milk is generally subjected that is sold *as such* in all our large towns. It would be a hard matter to find, in all the Southern States, a single negro man—even a free negro—of whom it could be written as by the very intelligent London correspondent of that ablest and best paper in the Union, the *National Intelligencer*, as I read in the one of the 21st inst. The writer, himself, it would seem, a loyal but candid Englishman, says:

"The poor in England have suffered much from the failure of the potatoes, but the more intense suffering of the Irish has directed the mass of public attention and sympathy in that direction. I lately asked a working man (who had then constant employment) what difference the high price of potatoes made to him. He replied: '*Before*, when I was in work, I *almost* always contrived to have a *piece of meat on a Sunday* for dinner, but I could not manage it the *last* Sunday, nor can I the *next*. We used to buy potatoes at 5d. or 6d. (10 or 12 cents) the peck; now they cost me 1s. 3d. (30 cents) the peck. *I do think it hard that we cannot have a morsel of meat on a Sunday.*'"

As now I have scribbled as much as you would like to make room for in one number, I will have to reserve some account of the several Mineral Springs, with some notice of the grasses and the game of this portion of the State; and will therefore conclude this protracted letter with the general remark that it seems to me the good people have not sufficiently attended to changes of Husbandry suggested by the change in the commercial circumstances which *steam* has wrought in their position and pursuit as agriculturists.

There is, moreover, an almost universal neglect of *barn-yard and stable ma-*

nure, and all other fertilizers, except plaster of Paris and clover; conservative and valuable as these are, experience will finally reveal it as a great error to those who put their faith in these alone to sustain and improve their estates. Furthermore it may be added that the course and objects to which I would invite their attention, and which Nature seems to indicate—that of increasing their meadows, improving their pastures, raising more stock that may go on the hoof to market, and making more cheese, butter, and wool; giving to their capital and labor a more extended application in these directions—will have but imperfectly accomplished its legitimate and natural end, if it do not vastly increase their *stores of artificial manure*. The New-England reader, who gathers up the droppings of every beast of the field, and would save that of the birds of the air if he could, as if it were gold-dust—he who buys his corn from the South, and yet makes the hog that eats it pay for it with his offal, will scarcely believe that some farmers in Virginia who number of domestic animals more than a hundred, save scarcely manure enough for their kitchen gardens! Will he believe that vessels have loaded lately with ashes in Fredericksburg, to be taken to fertilize the soil of wide-awake, sharp-witted little Delaware? But *there*, you tell us, they freely patronize and read THE FARMERS' LIBRARY! In conclusion, Mr. Editor, allow me to subjoin, in the way of advice for the good people of Virginia—toward whom my heart has always had a scarcely less than filial yearning—a few homely lines:

"Cultivate little, but cultivate well,
Your crops alternate, if good produce you 'd sell;
Your soil manure often—the return it yields
Will tenfold repay what you spend on your fields.
Sow grass, too, at times, if you wish to make sure
Of having a plentiful stock of manure.
Without grass you've no cattle—without cattle, 't is plain,
You 'll have no manure and without that no grain."

MONTGOMERY COUNTY (MARYLAND) FARMING.

As being quite apropos to some of the topics treated in the preceding communication, particularly the use of *oxen* and of *lime*, we copy from the *American Farmer*, with particular pleasure, the following most edifying Letter, from one whom, in a sense of justice to the man, as well as of policy toward the agricultural interest, we have repeatedly characterized as a worthy fugleman in the march of improvement, by which his immediate neighborhood, (thanks to himself and and the *friends* who compose it,) has for years been gaining more and more of enviable distinction. And how much more truly honorable in the eyes of all humane and well-judging men are the trophies thus won by the Plow, and by *mind* applied to peaceful Industry, than such as are stained with Christian blood in wars of invasion and conquest!

Every sentence, every line, of this letter has its moral and its value. Who indeed shall measure the value of the *examples* of men who thus demonstrate, in the face and eyes of the most incredulous and indolent, how small and exhausted farms, with means proportionably limited, may, by indomitable perseverance and skillful treatment, be brought ultimately to a high degree of fertility—and thus how Agriculture, as compared with other more attracting and fashionable pursuits, may be made to yield a comfortable living and a living profit on the capital and labor, and *intellect* employed! *Theirs* is a lesson for the millions—for it shows why and how men in ordinary if not in indigent circumstances, need not despair—need not abandon their little farms, however reduced, to go, in search of easier lives and better fortunes, either into the dangerous and corrupt atmosphere of large towns or into a condition of yet more corrupting and miser-

able dependence on the spoils and schemes of party. Mr. Stabler and his neighbors show, on the contrary, how—by inquiry, by the exercise of thought, combined with a hopeful temper and a resolute spirit to improve the gifts of a kind Providence—a barren may be converted into a rich soil, and the very desert be made to "blossom as the rose." Yes, truly inappreciable is the lesson of those who thus prove for the honor of Agriculture that it is essentially an intellectual calling, which and when so pursued, will cause the poorest soil to repay honestly the small advances which the rich may vouchsafe to loan on the faith of its ulterior capabilities—and finally how it may yield to those who thus cherish it, the most respectable and independent sort of support that an honest man can covet or enjoy.

Mr. Stabler's was not the rare case of a farmer amply provided with the wagons, implements, and machinery; horses, mules and cattle—appendages of large establishments—with abundant capital to purchase lime, ashes, and guano; taking up a lot in one corner of a large farm and concentrating upon it the means of bringing it round from great poverty to great productiveness as quickly as, in the nature of things, poor land can be made rich, by strong judgment, the power of capital, and the use of all the fertilizers, animal and mineral; else, as he tells us, the great results achieved by him, in twenty or thirty years, out of his small beginnings, might have been more profitably brought about in less than a fourth of the time. It took him, as we see, seven years to realize the first visible melioration produced by lime—whereas if he could have had the offal of a large stock, together with ashes and bone-bust and guano at pleasure, a yet greater increase of crops might have been reaped in a single year or two, at most. But how few of those whose hopes and expectations and dependence rest entirely on the resuscitation of their soil, have it in their power to seize precisely the most favorable times and seasons for the various operations necessary in the process of an experiment, and, by the application of redundant force, get all the manures spread, and all the work done, exactly at the right time? Thus thousands of farmers may be slow, or even fail in the best designs at improvement, without being delinquent, or obnoxious to the charge of want either of judgment or industry. In the Eastern States—under a wiser policy which encourages a Free Trade in money, and where every County has its moneyed institutions owned in a great measure by, and identified with the landed and manufacturing and mechanical interests—any respectable and discreet farmer or mechanic can borrow the small sums necessary to give activity to his personal acquirements, industry and enterprising disposition; and here is, in fact, one great root of their growth and prosperity—but is it so with farmers and mechanics in Maryland, Virginia and the Southern States generally? On the contrary, how humiliating, and after all how precarious and uncertain, the expedients and solicitations to which *they* must have recourse to borrow the smallest sums for a time within which any course of industry, however unremitting and skillful, will enable them to refund it! Let them, the mass of small farmers, who inherit small, and for the most part encumbered estates, answer the question.

On the other hand, the demonstration of Col. Capron, as detailed in the "*Farmer*" and other journals, is one of quite a different character, showing how, by a judicious, energetic use of ample means and appliances of every sort in hand, the most unpromising and exhausted old field may, in the shortest possible time, be brought round to a state of extraordinary productiveness—repaying outlay, and leaving it in such condition that nothing farther is needed but honest

and judicious treatment, thorough tillage, and a rational rotation of crops to enable it in future to take care of itself, and maintain its own productiveness.

The Montgomery County improvements, of which Mr. Stabler's may be taken as a favorable specimen, illustrate the case of sagacious neighboring farmers—beginning with poor farms and no money, at a time when the roads that lead to success had not been so well explored; striking and depending in a great measure on their own lights, yet with constant vigilance detecting errors, and, after many years of new and doubtful experiments and toilsome progress, reaching the goal of their noble ambition, and planting beacons along their track for the benefit of those who might follow in their wake! Can any measure, it may be asked, of honor or gratitude, be too full for those who thus serve the truest and greatest Interest of their country, if agriculturists only had the discernment to distinguish, in merit, "the true from the sham"!—In the other case, Col. Capron, possessed of all the lights reflected on the great art of Agriculture, by modern experiment and discovery, and all the means necessary to the most successful practice, with equal judgment and vigor, exemplifies, to the conviction of the most skeptical, the truth of the principles and the soundness of the system established by the laborious and costly experience of the men of Montgomery—who, with many others, have so efficiently assisted, for the last thirty years, in taking the sounding and laying down the chart for agricultural improvers.

But different as are the two cases, both have their exceeding merit and usefulness, in their way; while each addresses itself to very different classes—friend Stabler's to the thousands of American cultivators in circumstances more or less straitened, who need the encouraging influence of such examples to save them from despair—Col. Capron's speaks to the opulent and incredulous stock-jobber and money-changer, who worships the "almighty dollar," and who cannot be persuaded, but by such knock-him-down arguments as the Colonel's, that dollars can be plowed or dug out of the ground. If, then, his success should have the effect of turning to the country and to its noble and useful pursuits the minds and the means of wealthy drones, who are lounging away their unconsequential lives in the towns, dreaming only of sensual enjoyments and sordid accumulation—if it should, as it ought, have the effect of demonstrating to those men of overgrown fortunes bought with a wedding-ring, that their sons might find honor, and entertainment, ay, and *profit*—which many rich men like so much better—in practical Agriculture; should he thus turn to the country that current of capital and enterprise and labor which, under the influence of partial legislation, sets in all quarters away from the land into towns and manufactories, he will entitle himself to stand even yet higher than he does among the friends of the Plow.

After all, what the landed interest needs is, first, an earnest exercise of the mind, to understand the principles, practical and political, on which its success and prosperity depend, and then the *command of capital*, which is as much needed for the profitable manufacture of wheat, and oats, and corn, and tobacco, and cotton, and sugar, and rice, by the materials, power and machinery employed in their production, as it is to manufacture cloth and paper out of wool and rags. The published results of Col. Capron's experiments seem indeed emphatically to say thus to the capitalist of the City: "You, Sir, want respectable occupations for your sons, and the land needs the use of your surplus wealth. A farm, enough for your purpose, may be had almost for the asking. There it lies, like the hull and masts of a noble ship, at your wharf, already made to your hands; she requires only money to buy the sails and rigging, and to stow her

hold with flour, or tobacco, or rice, or pork. Without these, valuable as she will be, when thus equipped and laden, the hull *per se* is of no account. But furnish and fit her out, and place a skillful commander at her helm, and she will go abroad, and return laden with the produce and manufactures of foreign climes that will amply refund you principal and interest. Just so, and with yet more uniform certainty, will a farm make remunerating returns, if you will in like manner fit it out with adequate and suitable buildings, teams and implements—plow it deep and manure it well, as Col. Capron did; in a word, stock and man it well, and put it under the direction of a man of energy and skill, and it will pay you as the ship does—not, perhaps, sometimes, so much, but always a saving profit, without danger of being foundered or captured, and without the cost of insurance. Say, then, ye men of fortune, to your sons: 'Here! instead of dragging out your days in tedious expectancy and idleness, oppressed with ennui, and impatient for my shoes, take as much now of that which must be yours at my death, as will buy you a snug farm in a neighborhood of honorable, industrious men; furnish it with good and substantial buildings, implements and working power; ditch and drain it; prepare your meadows and plant your orchards; study the principles of your pursuit in books that explain the philosophy and papers that record the results of all agricultural operations. Make yourself familiar with the mechanical principles of all your implements, and the philosophy of the best rotations in farming; scrape acquaintance and cultivate intimacy only with neighbors—rich or poor—of sound character and judicious practice, whose honor and industry have given them credit and power to rise from indigent or moderate circumstances to competence and public esteem. Treasure up their maxims and observe their management. Renounce, my son, in a word, a life of inglorious indolence, and expectancy from the future, for one of active and honorable usefulness. Go, and let the means which avarice would teach me to withhold, transform you from a shapeless and loathsome grub into an active and useful member of the great hive of social humanity.'"

Such ought, and such, to a certain extent, we may hope will be, the effect of Col. Capron's demonstration of the improvability—the restorability, if we may say so—of land out of which the blood and very marrow of life had been worked, by processes which everywhere and to the end of time, will lead to that result, as certainly as cutting open the goose will cut off the daily supply of golden eggs.

We should like to see an agricultural survey of the economy, conduct and products of another and a *large* estate in Maryland, brought round by its own resources, anticipated, it may be, but if so, refunded—one which has been within a few years shaken out, as a lazy beggar from his rags and filth, into comeliness and activity. If not to be had otherwise and better, we will some day take the survey for ourselves. It is an estate on "West River," of probably 1,000 acres, with a large force, yet which, at the death of its late owner, did not more than make "both ends meet." Being wisely placed by its benevolent owner under a manager who has a genius for managing labor and improving land on a large scale, he has caused the whole estate to assume a fresh, thriving, fruitful aspect, and to yield to its present owner some ten thousand a year:—all this the fruit of a clear judgment and provident forecast, and discipline tempered with humanity—and, being so tempered, they always promote and sustain each other. Need we say that we allude to the old "Dodem" estate, under the care of John Crawford?

P. S.—It need hardly be added, that in such surveys nothing should be extenuated. The account and the results, the outlay as well as income, the loss as well as the profit, should be fully and fairly stated.

SANDY SPRING, 6th mo. 8th, 1847.

Esteemed Friend—H. CAPRON: In complying with thy request to furnish some notes of the method adopted to improve my farm, I should first, perhaps, give some general idea of the kind of soil and condition when it came into my possession.

The under stratum is a stiff, tenacious clay, making good "brick without straw;" and the soil itself, like most of the lands in this section of country, had been worn out or greatly impoverished by "the old Maryland plan" of raising alternate crops of corn and tobacco; and what little fertility was left in it after the tobacco culture ceased, (because the land was too poor to produce remunerating crops any longer,) was, by a long course of tenantry, pretty effectually used up; this was certainly the case with my farm of little over 100 acres. An able-bodied man, owning the land and doing all his own work, might possibly make a trifle over a bare support; but I had not this advantage, being compelled by ill health to resort to the country, and abandon the pursuits for which I was educated.

I knew literally nothing about farming, but did not doubt that by plowing in green crops, &c., &c., my poor old fields could soon be made productive. Like many wise men, however, I found this plan of "renovating worn-out lands" much easier in theory than practice. There were two strong objections in my case to this method—a good one though it is, under favorable circumstances. My land was found, after repeated trials, too poor to produce the green crops *to turn in;* and it was also necessary, in the mean time, to grow something to live on, for I had not the money to spare to buy with.

I used plaster by the ton, but with no apparent advantage; nor was I much more successful in adopting General Beatson's plan of burning clay.

My first and most important change for the better was the substitution of oxen in place of horses, for all farm-work—plowing included. I found that two yoke of oxen could be better kept, and at less than half the expense of one pair of horses, to say nothing of the wear and tear of harness; by proper management each yoke plowed nearly as much as the horses, even in hot weather; and after working 4 to 6 years, were worth about first cost in beef.

The next experiment was the application of a few hundred bushels of shell-lime, hauling the sheels *twenty miles*, and burning them on the farm; and although a *heavy business* with my slender resources, I should have persevered, but for an accidental circumstance.

About 13 years since, an individual who owned a lime-kiln in an adjoining county, offered for an advance payment to furnish 200 bushels of stone-lime for $20—the refuse of a previous kiln, and air-slaked.

This 200 bushels was applied to four acres (on one side) of the poorest field I had; and was, I believe, the most extended experiment then made in the neighborhood with stone-lime. Some two or three persons had experimented on a small scale; one of which only had applied as much as a *load* of lime; and in no instance, as far I could learn, was the application repeated, for none appeared satisfied with the results obtained.

After four years very little change was perceived in the vegetation—nearly all the grass sown with the small grain having perished—nor was it to be wondered at; for the crop of corn, grown at the time of the application of the lime, did not yield *five bushels* of merchantable corn to the acre—most of the oats, succeeding the corn, was too short to harvest.

After seven years, this field coming again in course, was planted in corn—the season most unpropitious; yet without the addition of a shovelfull of any other kind of manure, the yield was generally estimated at 30 to 35 bushels per acre; on the adjoining land, not limed, the product was still about four to five bushels—the part adjoining, as also the four acres, had 80 bushels of lime for this crop, (making 130 bushels to the acre for the portion previously limed,) but the application was so recent that no effect was perceived in the crop, and the increased fertility of the four acres was attributed entirely to the previous dressing of 200 bushels.

Corn that season readily sold for $1 per bushel, as the failure in crops was very general; and according to the best estimate I could make, this single crop more than five times repaid the whole cost of the lime and interest of the money expended. The succeeding crops of small grain *could be harvested* very readily. The clover *now* began to grow, and the plaster to act; as the soil was comparatively light, and even changed in color, by the action of the lime. The clover seed, a good crop, was clear profit, and it was the first I ever cut, or was ever likely to cut, on the "old plan of farming," (even with the most "dogged perseverance, untiring patience, and hard labor," guided by all the "skill and judgment" that I possessed,) which, as I understand it, is "making the soil improve itself, while it yields a support." This may be effected with even ordinary skill and judgment, where the land is not too much exhausted, and with other resources to live on in the interim.

But to return to the lime, which, to use the identical words of a neighbor who examing my experiments, appeared to be my "only chance of salvation" in farming.

These results were sufficient to satisfy the most incredulous; and induced me, as well as some of my more enterprising neighbors, to lime as freely as our (generally) limited means would admit of.

For a considerable quantity of lime I paid 18 to 20 cents per bushel, and hauled it six miles; then had it delivered at 24 cents per bushel—but as my resources increased, both from the improvement of the farm and otherwise, I found that a better business could be done by burning the lime on the farm. With this view I purchased a quarry, paying at the

rate of five hundred dollars per acre; and subsequently a second one, at the rate of eight hundred dollars per acre—being more accessible on account of the road; though both about five and a half to six miles distant. The stone is now hauled and burned at our leisure, which is of material advantage, as previously the convenience of the seller was alone consulted, be the state of the roads as they might;—all *cash* expenses included, my lime does not now cost me over about 5 cents per bushel.

We all know that with ample means at command, the same degree of energy and perseverance will attain similar ends in much less time; and I feel confident that, with my present experience and resources, I could just as certainly, and more profitably, have effected the same or even a much greater degree of improvement, in one-third the time, than was necessary under existing circumstances.

"No calling prospers without industry and perseverance," and those who are deterred from the attempt at improvement in a small way, because they have not the resources to begin on a large scale, are not very likely to improve at all; and were I to venture upon giving advice, it would be to make 20, 10, or even 5 *acres good*—for even the most limited resources may accomplish this much; this will afford the means to improve another five-acre lot, and, as the improvement advances, though at first by almost imperceptible degrees, the difficulties will gradually disappear and vanish; and if not literally reducing the "mountains into mole-hills," they may be passed over with comparative ease.

So far as my observation and limited experience extend, lime will improve *all* stiff clay soils; and if, instead of plowing it under, it is applied to the surface one or two years in advance of the cultivation of the field, so that the winter's frosts and rains may act upon and dissolve it, the farmer will not generally have to wait seven, or even five years, for a return. *Lime should be kept near the surface, and incorporated perfectly with the soil.*

I neither profess nor possess any more "skill and judgment" than many of my enterprising neighbors, though possibly *necessity* has compelled me to exert rather more energy than some others.

Now can it be supposed that in liming to the extent we have, and "using the highly-concentrated and bought manures," such as Guano, Poudrette, Bone-Dust, and Ashes, we do not find our account in it? We *know* that by a judicious application of them all, the outlay and interest are repaid by the *increased* product, and the land improved thereby much faster than without such aid. Last season we undertook to make up a Club for obtaining 50 tons of Guano, and get the discount; and I very soon had the names for 38 to 40 tons, without going a step out of my way.

Putting "dollars and cents" entirely out of the question, the reflecting mind—certainly an admirer of the beauties of Nature—must derive more satisfaction in witnessing his once barren fields clothed with verdure, and on reflecting that at least in some degree the change was wrought by his own exertions.

As it appears to be the "fashion" to illustrate by anecdotes, I will close these desultory and hasty notes by the relation of one, and in very few words. In raising my barn in 1822—quite a large one in those days—one of the assisting neighbors remarked that he was astonished to see me spend all my money in erecting so large a building, as one of one-fourth the size would hold all I ever could grow on this farm; and if it ever *was filled*, it must be by *flint-stones!!* which were, in fact, about as thick as the *blackberries* on every field. Mainly by the liberal use of lime, and with the "highly concentrated and bought manures" as adjuncts, I *have* filled it to overflowing, as also a large addition, and had to "stack out" besides. True, the flint-stones did aid, but it was by an extended course of under-draining, which was found to be as necessary as the use of lime. What I have done any one may do. To show still farther the onward strides at improvement in this section—proverbially barren and unproductive—I will only add than when I began my liming operations there were but three kilns within some 12 to 15 miles, and all in another country. Now there are twenty-seven within about six miles, nearly all of which are on the farms of the owners, and erected for agricultural purposes.

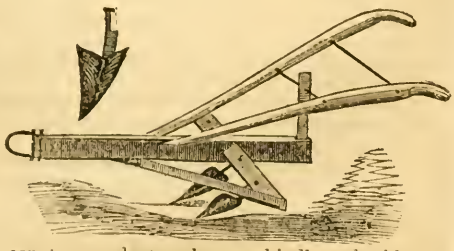
Thy friend,
EDWARD STABLER.

A CULTIVATOR.

SANDY SPRING, 6th mo. 15th, 1847.

To the Editor of the American Farmer.

Inclosed you will find a rough draft of a Cultivator, that is superseding all other kinds in this neighborhood. The tooth is simply a small shovel turned outward with the point a little hooked. The middle tooth passes through an iron strap, fastened on the lower side of the beam, and secures the cross-piece by passing through it—the more oblique the cross-piece the better we have found them to work. I will not conclude, after the manner of some of your correspondents, who very kindly and with wonderful disregard of self, praise an agricultural



implement in the highest terms, and then inform us that it can be obtained from themselves—but will conclude by stating that almost any farmer familiar with tools (and all farmers ought to be) can make one without difficulty. A MONTGOMERY FARMER.

From the (London) Mark-Lane Express.

THE GIANT SAINFOIN.

Sir: Having received numerous communications from different parts of the Kingdom, requesting further information concerning the Giant Sainfoin (as the introducer thereof has styled it,) I avail myself of the opportunity which your journal affords of replying to them *en masse*, and in so doing I shall confine myself to what has passed beneath my own observation.

The introduction of the variety, as your reporter states, was purely accidental; it was clearly a foreign species, but although various purchases of foreign seed have subsequently been made, in hopes of obtaining the same variety, they have hitherto proved unsuccessful. It was not until the year 1842 that my father, who was the then tenant of the farm I occupy, sufficiently overcame his skeptical notions in reference to its peculiar properties as a distinct species, as to induce him to give it a fair trial. Then, however, he procured of the introducer four bushels of seed, which cost him 80s. per bushel. This was dibbled between the rows of wheat sown upon a pea stubble; and, the seed being expensive, care was taken to drop only one seed in each hole, at intervals of from three to four inches, by which means nearly three acres were planted. The stubble was left upon the land for protection during the winter, but beat down, raked, and carted off in the spring. The crop was good for a thin plant, and would have cut more than 30 cwts. per acre; but my father, hoping to get two crops of seed, let it stand, which was injudicious, experience having proved that it is exceedingly tenacious of going to seed in a maiden crop; the second crop, although it went to seed again, was too late to be successful. In 1844 the entire piece was mown for hay, and produced from five to six tons; early in September it was mown again for seed, which produced about twenty bushels per acre. This was sown in 1845 upon a red loam with a chalk subsoil, after beans and peas, which had been well manured for the same, at the rate (by way of trial) of two, two and a half, and three bushels per acre, upon about 24½ acres of land, which have this season produced more than fifty tons of hay; the part sown the thickest answering the best. In August it was mown again for seed, and subsequently produced a good eddish for feed. The species has now been tested in this and the adjoining parish for fifteen years, and the price of the seed has varied during that period from 50s. to 80s. per bushel. It is quite clear that it will, like lucern, produce three crops for hay or soiling in one season, and the food in either case is much more nutritious. I have twelve acres, drilled last spring upon pea-stubble wheat, at three bushels per acre; the wheat was very fine, and partially down, but the plant is good. I shall now introduce it in regular course, sowing about twelve acres in each season upon pea-stubble wheat, to remain three years, and then break up for wheat, by which method your agricultural readers will perceive that only the barley crop will be sacrificed in one round. In this way I shall obtain thirty-six acres for hay in each year, and thirty-six acres for seed, or for second and third crop, as may appear most advisable. This will furnish me with all the hay I shall require, leaving my closes wholly for sheep feed; but whether this will prove the more excellent mode of turning this peculiar variety to the best account, experience alone can determine. I shall only add that I have still a very large portion of my crop of hay remaining, and a small quantity of the seed in an unthreshed state, with thirty-six acres in plant, and should any of your readers who are curious, or feel interested in the cultivation of the plant, pay me a visit, I shall be happy to see them, and will furnish them with any additional information I possess.

I am, Sir, your ob't serv't, JOSEPH HINE.

Newnham, near Baldock, Feb. 19, 1847.

TO PREPARE BEESWAX.—To obtain wax, boil the combs in a strong muslin bag, in a saucepan, with water sufficient to keep the bag from burning; and while boiling, continue to press the bag with a wooden slice or spoon, to extract the whole, as you skim off the wax. Drop the wax into cold water, where it will swim on the surface. The wax thus obtained will still want refining, to effect which, place it in a clean saucepan and melt it over a slow fire. Then pour off the clear wax into proper vessels and let it cool.

NICE CREAM CRACKERS.—One pint cream, six eggs—beat the whites to a froth; if the cream is sour a spoonfull of saleratus must be used. Mix the dough very stiff and pound it half an hour.

LECTURES ON BOTANY.*

COURSE OF LECTURES ON BOTANY IN REFERENCE TO AGRICULTURE.

By CHARLES JOHNSON, Esq., *Professor of Botany at Guy's Hospital, &c. &c. At Messrs. Nesbit's Agricultural and Scientific Training School, Kennington Lane, Lambeth, near London.*

LECTURE II.

OUR preceding Lecture was dedicated to the detail of a few of the advantages that have already resulted from the knowledge of a simple fact in vegetable physiology, namely, the influence of the external organs or parts of the flower in the production of the seed. It is a subject on which we might dwell at much greater length, as manifesting the vast importance of a branch of study that the practical cultivator, regarding it generally in the light of an abstract science, has hitherto considered rather as an amusement for the idle speculator, than as intimately connected with the practice of his profession, and illustrating those processes of his art that have been established by the slowly accumulated experience of himself and his predecessors. But this early stage of our inquiry is not the fitting place to extend our remarks upon the action of organs whose operation can scarcely be comprehended without reference to their own ultimate structure—in other words, to the minute organs or vessels of which they are themselves built up; and this observation applies not only to the flower, but to every part of the vegetable fabric: every product of the plant, whether cultivated for food or as adapted to the other almost innumerable wants and purposes of man—nay, its very existence—is dependent upon these.

A vegetable is a living being, and, as such, is made up of parts or members, all more or less influencing each other, and united and simultaneous in their operations for the growth and preservation of the whole. Some parts, when cut through, appear solid to the naked eye, others present a minutely porous appearance; but under a microscope or strong magnifying-glass the apparent solidity of the hardest and closest wood disappears. It is in these small and all but invisible cavities that the vital functions of the being before us are to be traced; it is here that are elaborated the starch, the gluten, the gum, the sugar, and the other proximate principles of our food; here are formed the tannin, the dye, the medicine; the production of the wood, the bark, the differing fibre of the flax and cotton, and the increase of the universal substance of the plant itself, are all of them processes dependent upon the economy of these mysterious recesses. The prying eye of curiosity is sometimes at fault in its endeavors to penetrate the sources of organic action, but a glance is often sufficient for the speculative mind of man to work upon and form a hypothesis which a second will enable him to improve into a theory, and although we positively know but little, that little enables us to assume a great deal, and this is especially the case as regards the science of Vegetable Physiology, or that which treats of the natural laws regulating the growth of plants and their productions, as just referred to. In giving you a general outline of the action of these laws, and endeavoring to explain the structure through which they operate, I shall avoid as much as possible reference to what is merely suppositious, relying upon the statement of facts, and such conclusions as, though in our present state of knowledge they are incapable of being positively demonstrated, are still so closely accordant with what we really do know, that, until they are contradicted by facts, we are justified in regarding them as such themselves.

Divide the stem of any common plant transversely or crosswise, and examine the section with a microscope, it will present the appearance of net-work, the meshes of which are of various sizes and figures, some perhaps regularly hexagonal, or six-sided, like the cells of a honey-comb, others more irregular, others square, and some circular; the circular ones are generally disposed in groups; which are sometimes scattered, sometimes arranged at corresponding intervals in a concentric manner. If we divide the same stem perpendicularly, or lengthwise, we find the angular meshes presenting a nearly similar appearance, showing them to be small, membraneous cells or cavities, while the circular ones are discovered to be sections of little tubes, more or less elongated, and narrowing toward each extremity so as to terminate in a point, and farther that they are disposed in longitudinal layers, or thread-like bundles. These cells and tubes are denominated the elementary organs of the plant; and minute examination of them shows that, independent of differences in form, size, and disposition, they vary greatly in structure, and are probably subservient, in consequence of that variation, to the performance of different functions; these functions, however, are, in our present state of knowledge, very imperfectly understood; of many, and those perhaps the most important, we are altogether ignorant; while others are little more than surmised from their apparent connection with some obvious fact in vegetable growth, such as the

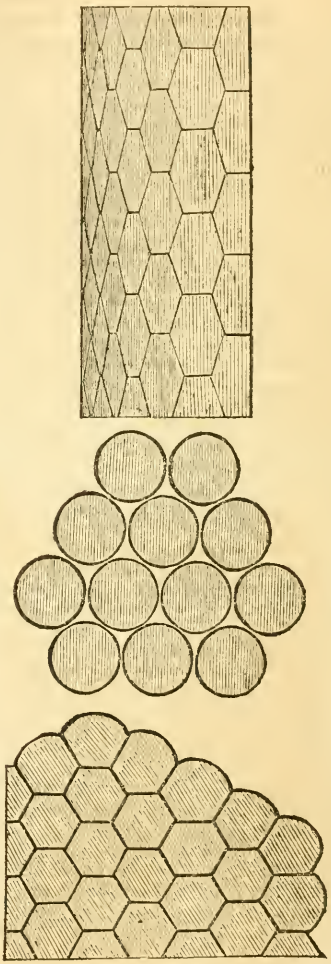
* Continued from page 377, Vol. II., Monthly Journal of Agriculture.

rise and distribution of the sap, &c. So very minute are the elementary organs of plants individually, and so obscurely revealed are their physical phenomena, even with the assistance of the most powerful microscopes, that few observers agree in their accounts of either, beyond the admission of certain general facts.

The simplest definable form of the vegetable tissue or substance appears to be the cellular, namely, that presenting in division the angular meshes just referred to; each of these meshes is the section of a cell, consisting of a very delicate transparent membrane, rudimentally globular, but assuming different figures in consequence of being pressed upon by others in the growing plant; when equally pressed on all sides by similar cells, the globe becomes twelve-sided, and of the form denominated by mathematicians the rhomboidal dodecahedron, which being divided in either direction, presents a hexagonal outline, resembling the cells of a honey-comb; where the pressure is unequal, the regularity of the cells is variously affected and distorted, and they become more or less oblong and rectangular, or present such a diversity of figures in different plants, and in different parts of the same, that the delineation of them would require a far greater space than our confined limits will admit, or the subject before us justify the dwelling upon, where a hasty outline will answer the end proposed, without entering into minutiæ belonging to the more abstruse and philosophical portion of the science. Cellular tissue constitutes a very considerable portion of the substance of all plants; the pith is wholly composed of it; so is by far the greater part of the bark, and the external covering of the more delicate organs; while, filling up the interstices left by the disposition of the woody and other tubular tissue, it seems to be almost analogous to fat in the animal economy, and, like that, increases so much, under certain circumstances, as to alter materially the general aspect and condition of the plant; it is indeed that part of the vegetable fabric that is the most influenced by cultivation. The magnified views in fig. 1 will convey some idea of the arrangement of the cells, and especially of the origin of their angular outline, which is very beautifully seen by the assistance of a microscope, or even by a good magnifying-glass, in a thin transverse slice of the stem of the common raspberry, or that of any other plant in which the pith is not invested by a very thick cylinder of wood. The size of these little cells varies from the fiftieth to the thousandth part of an inch in diameter, their average bulk being about midway between these estimates. In the earlier stages of their existence they are filled with a fluid in which a multitude of little colored bodies, only visible under a very high power of the microscope, are seen floating with greater or less rapidity—a phenomenon apparently as intimately connected with that of vegetable life as are those of the lymphatic and arterial canals to animal existence.

Cellular tissue has been justly denominated the basis of the vegetable fabric. The simplest of all known plants exists as a single globular or oval cell; those a degree higher on the scale are composed of similar cells, more or less elongated and attached end to end like the beads of a necklace; then come others more complicated by the attachment of cells in breadth as well as length, the lower or meaner of which present mere shapeless or irregular masses, while the remainder of the series, ascending by successive grades of structure, may be traced by the eye of the naturalist through a thousand varied and improving forms, so beautiful, so admirably

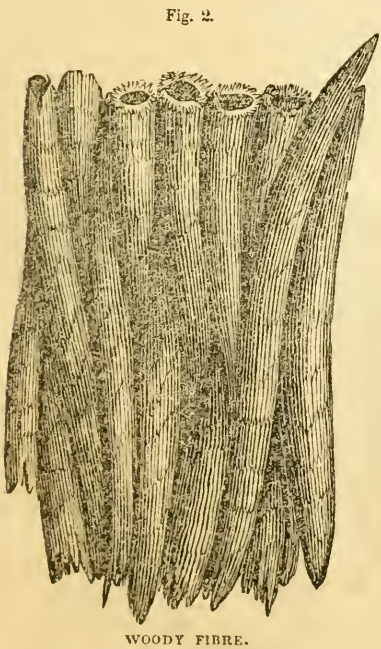
Fig. 1.



CELLULAR TISSUE.

adapted to the fulfillment of the offices allotted to them by Providence, as to force themselves upon the attention of man, though too distantly connected with his immediate interests to admit of his due appreciation of their value. Under myriads of modifications, which our space will not permit us to investigate, this tissue constitutes the whole substance of the lichens, sea-weeds, mosses, and other allied and equally neglected families of plants. However different in appearance such cells are from the little tubes with which they are found associated in all the nobler classes of vegetation, there seems at present to be scarcely a possibility of question that the latter are not merely the results of their super-development; in other words, that the tube, under whatever form it may exist, is but an elongated cell, or the breaking of the cavities of several into one. These, however, are speculations that we may hereafter refer to more particularly; let us look previously at the tubes themselves, and note what is known or understood respecting their uses in the economy of the growing plant, and first at those which compose the principal substances of the wood, its harder and tougher portion, called woody fibre.

Fig. 2.



WOODY FIBRE.

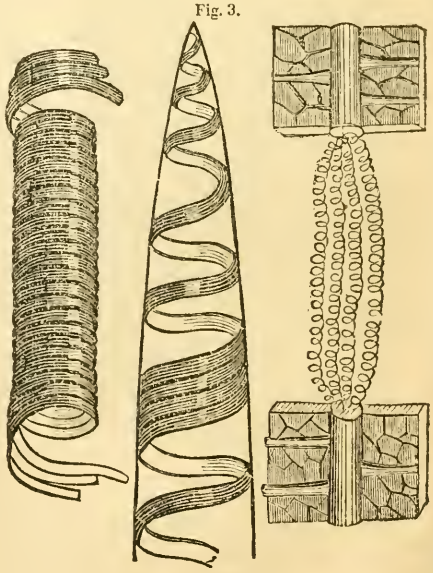
If the diameter of the cells just described is so small that without assistance from the microscope we are generally unable to distinguish their cavities, that of the woody tubes is frequently much less, and in some plants not more than the five-thousandth of an inch. Fig. 2 represents a small fragment of oak wood highly magnified, showing it to consist of such tubes closely disposed upon each other, so as to occupy the smallest possible space, and leave no openings between them, the narrow, tapering or attenuated extremities of each generally lying between the broader portions of those that lie around them. These tubes extend in the form of continuous bundles or layers from one extremity of the plant to the other, sending out branches into the leaves and other subsidiary organs, and giving strength to, and maintaining communication between all its parts; they constitute the channels through which the sap ascends and is distributed, a fact readily ascertained by cutting into the stem or branch of a vine, birch, or any other tree in the spring, when that fluid may be traced as flowing from the mutilated vessels of the wood. The passage of the sap through this medium, though certified by long observation and repeated experiment, would appear to those who examined the vegetable texture for the first time, or without a previous acquaintance with the natural phenomena connected with organization, as an inexplicable mystery, no apertures being discernible under the highest powers of the microscope, through which the cavities of the woody tubes communicate with each other. The discovery, however, by Mons. Dutrochet, of the permeability of vegetable and animal membranes, or that they are capable of transmitting fluids through their substance, although destitute of any apparent passage of communication—a phenomenon to which he gave the name of *Endosmosis*—has contributed greatly to the elucidation of this and other physiological facts, that were as stumbling-blocks to the philosophy of our forefathers. The demonstration of this important fact is easy, and within the reach of those even whose means of scientific inquiry are the most limited, as instanced in one of the earliest experiments of Dutrochet himself: he filled the swimming-bladder of a carp (any other small bladder will answer the same purpose, and any fluid heavier than water) with a thin solution of gum, and, placing it in a glass of water, observed that the bladder swelled out and became heavier, in consequence of the water being attracted through its substance by the weightier fluid within: he reversed the experiment by filling the bladder with water, and placing it in the mucilaginous solution, under which circumstances it lost weight, by the water passing out instead of in. It was afterward ascertained by numerous experiments that plants placed in water draw it up through the thin tissue of their cells and woody tubes, and acquire a great increase of weight, which they lose again, at the will of the experimenter, by simply adding to the water in which they stand some soluble substance, sugar, for instance, that renders it heavier than their contained juices. The force of this attraction, and of course the facility with which the fluid passes, is very

considerable; water holding half its weight of sugar in solution raised pure water through membrane with a power capable of sustaining the pressure of a column of mercury of 127 inches in hight, a power nearly four and a half times greater than the pressure of the atmosphere which sustains the mercury in the barometer and raises the water in a common pump. On the cause of this curious phenomenon philosophers are not agreed: it is probably only one of those numerous instances that are from time to time brought to light by inquiry into the hidden processes of Nature, of the general tendency of matter to maintain an equilibrium among its particles; but the permeability of the vegetable membrane being established, it is not necessary to our present purpose to pursue the subject farther: we have only to consider, as a natural consequence of the development of the living plant, that the sap becomes thicker as it ascends from the root, drawing after it the thinner and more recently imbibed fluid, to account for its successive rise through the minute vessels above described—a rise so rapid that several quarts or even gallons are obtainable daily for weeks together by tapping the trunks of some tropical trees.

The fibre of hemp, flax, and of many other plants employed in different parts of the world in the manufacture of cloth, cordage, &c., consists of these woody tubes; and some idea of their extreme tenuity may be formed from the examination of the finest flaxen thread by a microscope, which shows it to consist of a considerable number of tubes. The membrane composing them, though delicate and transparent, possesses much strength and elasticity in most plants, and in all cases is greatly superior in that respect to cellular tissue, the membrane of which is comparatively brittle; the difference in the strengthof cotton and linen thread is an instance of this, the former being cellular, the latter woody tissue. The wood of the fir tribe appears to be very dissimilar to that of ordinary trees and herbs, the tubes being marked with dots or apparent pores, surrounded by a series of concentric circles; similar markings are observable in the woody tissue of a few other tribes, but only such as, like the plants in question, produce aromatic or resinous secretions, whence they have been generally regarded as glands; their structure is, however, at present very imperfectly understood, and not anything is known respecting their functions; if really openings, they constitute a remarkable exception to the closeness of the corresponding tissue in other plants.

The name of duct has been given to various comparatively large tubes or vessels, generally associated with those of the wood, but always distinguishable from them by their greater diameter. The large pores, frequently observable by the naked eye in a transverse section of wood, are the divided cavities of the vessel so called, which are sometimes distributed through the layers of wood, but more commonly form themselves distinct layers or bundles. Many vessels of different structure have been confounded under the general name of duct; and being wholly unacquainted with their offices in the economy of the plant, much diversity of opinion exists among physiologists respecting their classification and relative uses. Some are angular, and very evidently formed by the breaking of cells longitudinally into each other, or by the absorption of the dividing membrane; others are dotted with apparent pores; a third kind are more or less distinctly marked with spiral lines, sometimes continuous, occasionally broken at irregular intervals, as though a spiral thread contained within a membrane had had its coils separated and ruptured in places by the longitudinal growth or extension of the membrane; a fourth series, called annular ducts, consist of concentric rings, or perhaps of the coils of spiral threads so broken as to present the appearance of such, and held together by the membraneous tube containing them. These larger tubes are disposed in a similar manner to the smaller ones of the wood, and resemble them in being more or less narrowed or conical at their extremities: several of their forms, and there are some intermediate between those described, approach so nearly to the following form of tissue, that it is difficult to conceive them other than more imperfect or disurbed modifications of the same, viz., the spiral vessel.

Fig. 3.



SPIRAL VESSELS.

This last form of the vegetable elementary organs consists of one or more filaments coiled spirally within a very delicate membraneous tube, similarly attenuated toward either end as are those of the wood and the duct, but, unlike the spirals apparent in some of the latter, capable of being drawn out like a spring, when the part containing them is broken. They are very advantageously seen by breaking carefully across the leaf of a rose or strawberry, or the young brittle shoot of the rose, and drawing the parts slowly asunder, as exhibited in fig. 3. The spiral coils are in most instances so close together as to appear to form the tube, and the membrane which invests them is so exceedingly fragile as to break between each coil of the spire when it is drawn out, so as not to be readily discernible unless occasionally when the extremity of the filament is relaxed, as represented in one of our figures. Each spiral is generally composed of a single filament or thread, but in some plants the number of parallel fibres twined in the same direction is considerable; one of the figures exhibits a magnified view of a portion of such a vessel from the stem of a banana, consisting of three threads or fibres; but in this, and many other plants of the same and allied orders furnished with compound vessels, there does not appear to be any regularity in their production. De Candolle remarks that the number of threads composing each spiral of the plant just referred to varies from seven to twenty-two; but they are sometimes formed of a single thread, and I have found in the same portion of the stem no fewer than eleven different modifications of these curious vessels, varying in the number of their threads from two to twenty-nine, the largest number which has, to the best of my knowledge, been met with in any plant. The size or diameter of the spiral tube is exceedingly variable, the largest being about the three-hundredth or four-hundredth of an inch, while in some cases they are not above the two-thousandth or three-thousandth. They are variously distributed, but chiefly in the young stems or shoots, in which they occupy that cylinder of woody substance that immediately surrounds the pith, called the medullary sheath, and in the stalks and veins of the leaves and other organs which are modifications of them and originate from the sheath in question. They are of very rare occurrence in the root, and still more so in the bark and the true wood, or that which in after periods of growth forms around the first year's layer. Where the tissue of the stem is not stratified, and the pith or cellular substance does not form a separate cylinder or column in its center, as in the liliaceous orders, palms, and others belonging to the same great natural class, the spiral vessels accompany the bundles of woody fibre and ducts that lie dispersed through its mass, and are present often in such abundance as to constitute the most remarkable feature in their internal structure; from the stems and bases of the large leaves of the banana and plaintain they may be drawn out by the handfull, and in the West Indies are sometimes collected in this way for tinder.

The use of the spiral vessels in the vegetable economy is, like that of their other minute organs, rather to be surmised than demonstrated. A very general opinion, from the earliest period of their discovery, regarded them as organs of respiration; hence their denominations of "trachea" and "tracheuchyma," alluding to their supposed correspondence in function with the trachea (or windpipe) and air-tubes in the lungs of an animal; to those of insects their structure presents a remarkable parallel. They are generally filled only with air; and although instances may occur in which they are "gorged with fluid," such instances are rare, and probably either accidental, or arising from one of those morbid changes to which the minuter portions of the vegetable fabric are unquestionably liable, although their causes are hidden in consequence of our imperfect knowledge and slender means of inquiry. The opinion, however, founded only upon analogies that may be rather fancied than real, seems of late years to have been gradually losing ground in the estimation of some of the best physiologists, although they have been hitherto incapable of substituting a more plausible hypothesis; and the principal argument that can be adduced against that previously entertained, consists in the fact that the spiral vessels of plants are not in immediate connection with the surface pores or stomata, nor even with the air-chambers with which the latter communicate, and hence differ from those accompanying the breathing apparatus of an insect. When, however, we reflect upon the permeability of the vegetable membrane to a comparatively gross fluid like the sap, the passage of one so thin and infinitely more diffusible as air can scarcely be denied, even though it had to penetrate to a much greater depth than to the interior of a leaf, an organ the structure of which is so strictly accordant with its supposed and almost experimentally-proved function as the vegetable lung.

Under whatever conventional name the elementary organs are known, however great the apparent difference of their structure, and diversified their functions or offices, the deep and unwearied researches of modern naturalists aided by the increased powers of observation placed at their command by the improvement of the microscope, have led to the conclusion that they are all only so many modifications of the cell, while the wall of the cell itself is probably merely consolidated mucus, assuming the form of membrane or fibre, according to laws of which we are at present ignorant. That changes take place of one kind of tissue into another, at different stages of the growth of the plant is unquestionable, as well as that such changes are correspondent with alteration of function; but it is no less

certain that the simple cell contains the rudiments necessary to the formation of the other organs, and especially the spirals, which in their most perfect state appear to be the most complicated of the whole series. "There is no doubt," observes Dr. Lindley, speaking of the different kinds of vegetable tissue, "that all these forms are in reality modifications of one common type, viz., the simple cell, however different they may be from each other in station, function, or appearance. For, in the first place, we find them all developed in bodies that originally consisted of nothing but cellular tissue; a seed, for instance, is an aggregation of cells only; after its vital principle has been excited, and it has begun to grow, woody tissue and vessels are generated in abundance. We must, therefore, either admit that all forms of tissue are developed from the simple cell, and are consequently modifications of it; or we must suppose, what we have no right to assume, that plants have a power of spontaneously generating woody, vascular and other tissues, in the midst of the cellular." Mirbel has lately reduced the first of these suppositions to very nearly a demonstration; in a most admirable memoir on the development of Marchantia, he speaks to the following effect: "I at first found nothing but a mass of tissue composed of bladders filled with little green balls. Of these some grew into long, slender tubes, pointed at each end, and unquestionably adhering by one of their ends to the inside of the sac; others from polygons passed to a spherical form in rounding off their angles. As they grew older, other very important changes took place in certain cells of the ordinary structure, which had not previously undergone any alteration; in each of these there appeared three or four rings placed parallel with each other, adhering to the membrane, from which they were distinguished by their opaqueness; these were together analogous to annular ducts. The cells which became tubes did not at first differ from other cells in anything except their form; their sides were uniform, thin, colorless and transparent; but they soon began to thicken, to lose their transparency, and to be marked all round from end to end with two contiguous parallel streaks disposed spirally. They then enlarged and their streaks became slits, which cut the sides of the tubes from end to end into two threads, whose circumvolutions separated into the resemblance of a gun-worm." In these cases there can, I think, be little doubt that the changes witnessed by Mirbel were chiefly owing to the development of a spiral thread in the inside of the tissue.

There is much diversity of opinion as to the mode in which the elementary organs of vegetables are multiplied during the advance of growth, and the rapidity with which that growth proceeds in certain plants is such as to render actual observations as to its source exceedingly difficult; speculation has therefore sometimes taken the lead where sober inquiry has proved at fault, pointing at results almost too startling even for human imagination to receive as truth; and yet, when we contemplate from day to day the increasing size of many plants in ordinary cultivation—a gourd, for instance, or vegetable marrow, adding to its circumference nearly three inches in the course of the twenty-four hours, and the stem which bears it extending its length between five and six inches during the same period, common sense would pause ere it questioned the truth of records much more marvelous. The rapid growth of the common mushroom has become proverbial, but some other individuals of the class of fungi greatly exceed it in that respect; the Phallus or stink-horn sometimes elevates itself six inches from the ground in the space of an hour; the Bovista gigantea, or great bull puff-ball, is recorded to have grown in the course of a single night from a mere point to the size of a large gourd, the actual measurement of which is not mentioned, but on a moderate computation of the diameter and number of the cells, it has been estimated to have increased at the rate of 4,000,000,000 of cells in every hour, or upward of 66,000,000 in a minute. It is true that much of this enlargement may have arisen from the distention of the cells individually; but even if this be admitted, the force of development and the vast increase of weight, which can only be accounted for by an appropriation of nutriment so rapid as almost to elude conception, leaves sufficient of the wonderful to impress upon our mind a just idea of the grandeur of that vital energy which inspires and regulates the growth of bodies thus low in the scale of organic nature.

The force with which the minute organs above described are produced and enlarged is no mere supposition, but a fact within the reach of attestation by those who will condescend to observe its operation; the root of a tree descending through a crevice will break and dislocate the hardest rock; cellular tissue, not harder in substance than pith, has elevated a weight with the power of a lever; the latter effect is not unfrequently seen in the growth of fungi under stones and heavy blocks of timber; and the following anecdotes, both, I believe, referring to the same circumstance, and copied from the *Hampshire Advertiser* of July, 1830, are recorded by Professor Burnet as affording a striking instance of this power: "At different times, several of the stones in the pavement in the town of Basingstoke, were observed day by day, to be rising gradually from their beds, until they were some inches above the ordinary level; under one of these, which weighed seven pounds, a large mushroom was found, that measured a foot in circumference." The other case is recorded by Mr. Joseph Jefferson, who says: "A toadstool six or seven inches in diameter, raised a large paving-stone an inch and a half out of its bed; and the mason who had the contract for paving was much enraged at the idea that a weak fungus

should have lifted so heavy a weight. But his uneasiness was much increased, and even his alarm excited, when, about a month after the injury had been repaired, the adjoining stone was lifted in a similar manner, and two mushrooms, not quite so large, were found beneath it; for it seemed doubtful whether the whole town of Basingstoke might not want repaving during the term of his contract. The stones were nearly of the same size; each being twenty-two inches by twenty-one; the last stone raised in this manner was weighed, and its weight proved to be eighty-three pounds." The hardest of such fungi are, in the growing state, so soft as to yield to the pressure of the finger, and so brittle as to be shivered to atoms by the slightest blow; yet the organic force with which their tender tissue is developed is capable, acting in millions of points, in the growth and distension of their individually invisible cells, of elevating an inert mass of stone which the strength of an ordinary man would with difficulty raise from its plaster bed.

Such are some of the facts connected with the minute anatomy of plants, the farther examination of which, and of the laws of their growth, will furnish the subject of a succeeding lecture.

PLANT MORE TREES.

Under the above head the Farmer's Monthly Visitor has a capital article, from which we learn several interesting facts. Gov. Hill, the Editor, says that "Valuable pine timber lots are now grown, whose origin was in the seed less than fifty years ago." The opinion has pretty generally prevailed that pines grown by artificial culture are nearly worthless for timber. We see no reason why this should be so, any more than oak, chestnut, or ash. Mr. H. remarks that "Nature does everything to make up for man's neglect in the planting and growth of trees; nor is she slow in her operations. She has made every acre of waste land in New-Hampshire valuable. The beautiful chestnut timber so much used in the New-England railroads grows spontaneously in all our poorest rocky lands which have been considered too hard for cultivation; the railway chestnut cross-timbers are worth, standing, on the average, sixteen cents apiece—trees of the suitable size making sometimes three and four cuttings. It is said these chestnut trees will grow to the suitable size of posts in the years that these posts rot in the ground. A remarkable feature in the chestnut is that where a main tree is cut, sprouts the same year shoot forth from the roots, growing up a clump of trees, some three to six of which soon grow into sizes to be used for timber."

We have had some little experience in attempting to raise a small forest of chestnut timber from the seed, but with poor success. We have been told that the seeds should never get dry after they ripen in the fall, before they are planted, either in pots or a nursery. Such is the demand for fence posts and railroad ties that the culture of chestnut timber, we are confident, can be made profitable. Every farmer has a wood lot, and as he thins it out, or cuts it off, he should set the ground full of small chestnuts. Under favorable circumstances they grow rapidly.

It is safe to calculate on the growth of a cord of wood on an acre per annum in Western New-York. This, at $2, is much better than no income—while the annual burden of leaves that fall to the earth enrich the land.

Shade trees are equally an ornament and luxury during the intense heat of our summer months. Speaking of these the Visitor says: "We boast in the southerly part of the Concord Main-street as beautiful elms as can be shown in any part of the world. There are many charming villas in the country range about Boston; but we must say of these that their cleaned path avenues shaded and covered over by trees high before reaching the limb, or surrounded by the shrubbery which entirely shuts out access of foot or of eye, do not compare with the unadorned beauty of the row of elms opposite on the street to the place of our writing. There is a remarkable similarity in the spread of the isolated elm, which is a native of our intervale and stands either on that or the first upland of the river bank. The men who set out our stately elms seventy-five and a hundred years ago, Hall, Shute and others, have passed away: at this season, when hundreds of birds come there and build their nests, the elegant gold-robin, the gay bluebird, the chattering wren, and even the shy crow, blackbird, the snarling cat and scolding thrush both sing so beautifully and so alike when undisturbed as to be mistaken each for the other—there is a charm in these venerable trees which bids us remember those who planted them there, and to present them as proof that planting trees is one of those "good deeds" of men which "live after them."

To Cure the Distemper in Horses.—Give a teaspoonfull, three times a day, of finely powdered gum myrrh, (mixed with the food or otherwise,) and a speedy cure, it is said, will in all cases be effected.

LETTER IX.

PROSPECTS OF THE WOOL MARKET—FUTURE DEMAND AND SUPPLY.

The Imports and Exports of Trans-Atlantic Nations...Means of ascertaining their Comparative Production...Table of the Imports of England...Amount of Wool grown in the United Kingdom, Consumption, Export, Facilities, including Soils and Climate, for its Cheap Production, and Prospect of its Increase or Diminution—Same of France—Same of Spain—Same of Italy—Same of Turkey in Europe—Same of Germany, including Prussia and Austria, with the exception of Hungary—Same of Hungary—Same of Russia—Same of Asia Minor—Same of Persia—Same of Independent Tartary—Same of Afghanistan and Beloochistan—Same of Thibet, Little Bucharia, and the remainder of China—Same of the Cape of Good Hope—Same of Australia and Van Diemen's Land...Conclusions in regard to Comparative Facilities, etc., of above Nations and the United States...The Northern States can compete with the most favored of them—and of course the South can, to much greater advantage...The South might safely embark in Wool-Growing, relying on the European Market alone...Rapid Extension of that Market Past and Future...But the American Wool-Grower is not compelled to seek a Foreign Market...Our Production does not meet the Demand of our own Manufactories...Table of the Imports of Wool into the United States...Table showing whence we Import Wool...Letter from Samuel Lawrence, Esq., showing the increasing call for Manufactories—The Stability of existing ones—and their ability to compete with those of Foreign Countries...Extent of our Consumption of Woolens above the Supply made by our Manufactories...Table of Imports of Woolens...Probable Increase of our Manufactories...Reflections on the Tariff...Rapidly Increasing Consumption of our Population—Amount Consumed per head...Table of Increase of our Population...Future Increase...The Amount of Wool Necessary at various Future Periods.

Dear Sir: Probably there are few men who now dream of any danger to the wool-grower of the United States, in the *home* market, from *trans-Atlantic* competition. But there is another point of view, in which a glance at the facilities of the eastern nations, for the production of this staple, may not be uninteresting. *May we not undersell them with the raw material, in their own markets!* He who carefully and intelligently examines all the facts involved in the solution of this question, will find, in spite of the vague popular impressions which prevail on the subject, that so far at least as those nations are concerned, which *now* produce the greatest amount of the wool which supplies the markets of the Old World, the United States *can*, if satisfied with equal profits, *easily undersell* them.

As an importer of the raw and exporter of the manufactured article, England occupies the first place. In these particulars, she probably exceeds, by fully one-half, *all* the other nations of the Old World. France ranks next, and largely takes precedence of the remaining nations. Holland, though shorn, by disastrous political revolutions, of much of her ancient importance in this class of manufactures, still maintains a trade of some magnitude. Several of the German and Prussian States export particular descriptions of woolens; Italy sends out some light cloths; and Turkey the carpets of that name. A full exhibit of the exports of all the wool-producing nations, would not, of course, lead us to an accurate knowledge of the amount of their production—for there is no one which does not manufacture the raw material to some extent. But with what knowledge we can obtain of their manufactures, the former information would enable us to ascertain, approximately at least, the amount of their production. This is all that is necessary for our present purpose, for we do not now, in reality, so much seek their *actual* as their *comparative* production.

England, as I have before remarked, is the great importer and exporter. Her duties on imported wool are, as has been seen,* exceedingly low, and she makes no discrimination in this particular, in relation to bottoms, or the places of export.† The vastness and variety of her demand give a

* See Letter VIII.

† With the exception, of course, of her own Colonies, from which it is exported free.

greater certainty to the exporter of prompt and favorable sales, in her markets, than in those of any other nation. France possesses the advantage of maritime contiguity, for securing the raw product of the nations bordering on the Mediterranean; and therefore, in some instances, as in the case of Turkey, she receives more of that product, in proportion to her manufacturing consumption, than England. But in one respect the latter has the advantage in securing the trade of the Levant. Between the natural products, and, of consequence, the exports of France and those of the other nations bordering on the Mediterranean, there exists a great similarity. She cannot send her wines to Hungary, nor these nor her silks to Italy, in exchange for wool. Her fruits, and indeed all of her natural products are the same with those of the whole south of Europe. England, the producer, and the great mart of the products of Northern Europe, can offer these in the Mediterranean on better terms than France; and in the manufacture of cotton goods, the main article of dress, and consequently one of the great ones of import throughout the whole Levant, the former possesses a decided superiority. All these natural and artificial circumstances have their weight, sometimes in favor of one, and sometimes the other of these nations, in determining the course of trade—and habit, ancient commercial associations, and even national predilections also throw their weight into the scale. In looking at the subject as a whole, however, all these facts, unless in a very few instances, so far offset each other, that in obtaining a view of the wool trade of England—her imports—we obtain a sufficiently accurate picture or index of the *proportionable* exports of all the nations of the Old World.

Before proceeding to ascertain the actual facilities of the several countries named in the Table, for the purposes of wool-growing, it may be well to briefly glance at that of England herself.

Mr. Luccock* estimated the produce of wool in England and Wales, in 1800, to be 393,236 packs,† or 94,376,640 lbs.; and in 1828, Mr. Hubbard‡ placed it at 463,169 packs, or 111,160,560 lbs. According to a Table formed by order of a Committee of the House of Lords, the same year, the quantity produced on an average of years, in England, is 111,160,560 lbs. According to Mr. Luccock's estimate, (in 1800,) the number of sheep in England and Wales was 26,148,463. It is not thought to have varied much since. The Encyclopædia Americana,‖ (published 1835,) on the authority of the Edinburgh Encyclopædia, sets down the then present number of sheep in the United Kingdom as follows: in Scotland 3,500,000; in Ireland probably under 2,000,000; in England and Wales the same number as in the time of Mr. Luccock;—so that the aggregate number would be about 32,000,000. It will thus be seen that England and Wales, with an area much less than that of Virginia,§ have almost 7,000,000 more sheep than the whole number in the United States in 1839!

Large as is the amount of wool produced in the United Kingdom, it does not meet, in the number of pounds, the amount required for woolens consumed in the United Kingdom alone.¶ It is true that England has exported some combing wool, of her own growth, to meet the wants of a certain class of manufactories (of worsted) in France, which could not obtain stock of equal quality in any other quarter; and she has also exported considerable quantities of her own coarse short wools. Of the latter, I am ashamed to say, the United States *have* been considerable purchasers. The whole export of England, in 1824, amounted to but little over 18,000

* See Luccock on Wool, p. 341 and Table.
† A pack of wool is 240 lbs.
‡ Quoted by Mr. Bischoff—See vol. ii., Appendix.
‖ Encyclopædia Americana—*art.* Sheep Raising.
§ The area of Virginia is 70,000 square miles, that of England and Wales 60,000.
¶ See Bischoff, vol. ii., p. 171.

lbs. From that time it has gradually increased, and in 1838 it reached 5,851,340 lbs.; in 1839, 4,603,799 lbs.; in 1840, 4,810,387 lbs.* Under the last year of the late Tariff, we received from England, of wools not costing to exceed 7 cents per pound, 1,188,800 lbs., and of those exceeding 7 cents, 28,406 lbs.; and from Scotland, of the cheaper class, 21,132 lbs.† This, however, only shows a surplus in *kind*, not in *quantity*. The English short wools have, as has been abundantly shown by the testimony of her most eminent manufacturers,‡ a *harshness* and *want of felting properties* which render them unfit, unmixed with a better stamp of foreign wools, for any but the very lowest description of cloths and stuffs, such as blankets, baizes, army cloths, flushings or bearskins, &c. Nor will they make *prime* articles, even of these low descriptions. England, therefore, after consuming such portions of these wools as she can, in the manufacture of the above-named and similar articles, and by mixing them, in the nature of an *alloy*, with better foreign wools in a low class of fabrics, such as flannels, livery and sergeant's cloth, etc., exports the balance to such nations as are *foolish* enough to purchase it.‖

The following Table, compiled from official sources, from Bischoff's "Comprehensive History of the Woolen and Worsted Manufactures, &c.,"§ gives the imports of England every fifth year from 1810 to 1840,

TABLE No. 8.

Countries fm.which Imp'ted	1810.	1815.	1820.	1825.	1830.	1835.	1840.
Russia	32,149	297,611	75,614	1,992,101	202,871	4,024,740	4,518,563
Norway	11,930	40,984		302			
Denmark	351,741	424,822	13,527	554,213	179,717	366,444	605,521
Sweden	15,424	32,889		3,497	380	1,431	5,961
Prussia	123,057	105,073	107,101	131,100	713,246	256,147	24,646
Germany	778,835	3,137,438	5,113,442	28,799,661	26,073,882	23,794,186	21,812,099
Holland	2,873	432,832	186,051	1,059,243	939,123	301,855	46,247
Belgium						231,222	134,095
France		756,427	230,909	436,678	45,093	104,535	48,830
Portugal	3,018,961	1,146,607	95,187	953,793	461,942	683,231	374,915
Spain	5,952,407	6,929,579	3,536,229	8,206,427	1,643,515	1,602,752	1,266,905
Gibraltar	349,053	12,891	3,851	19,250		476,737	242,734
Italy	21,554	97,679	2,815	227,453	9,461	1,051,005	1,668,541
Malta	40,040	55,804	5,050	72,131		39,913	2,209
Ionian Isles				25,983			121,110
Morea, &c						816,625	42,893
Turkey		12,513	189,584	513,414		1,281,839	655,964
Syria							34,049
Cape of Good Hope	29,717	23,363	13,869	27,619	33,407	191,624	751,741
Africa, other parts						5,102	337,908
St. Helena							4,683
East Indies	701		8,056			295,848	2,441,370
New South Wales	167	73,171	99,415	323,995	973,330	4,210,301	6,215,329
Van Diemen's Land					993,979		2,626,178
Port Philip							785,398
Swan River							42,748
South Australia							51,590
British America	1,217		139	70		14	15,793
British West Indies	2,894	53	760		1,725	2,029	3,286
United States of America		8,533	578	80,468	7,313	237,306	115,095
Guatemala							3,009
Colombia							842
Brazil	43,014	4,311	4,277	37	1,148	18,760	9,182
Rio de la Plata	73,159	41,527	68,759	331,265	19,441	962,900	616,721
Chili			14,792	2			586,796
Peru				14,313	5,741		
Mexico						1,213,740	
Guernsey and Man	41,407	6,264	19,015	22,266	7,745	246	11,830
Total Pounds weight	10,914,137	13,640,375	9,789,020	43,795,281	32,313,059	42,174,532	46,224,781

* Bischoff, Table 6th, Appendix. † Report of the Secretary of the Treasury, 1846.

‡ See Bischoff, vol. ii., pp. 107, 153, 154, 163, 173, 175, 176, &c. The testimony here alluded to, or an abstract of it will be given in a subsequent Letter.

‖ If these sound like *strong* expressions, I have to say that I shall be prepared to prove them, and shall so do, in a subsequent Letter, from the testimony of the first manufacturers of England before a Committee of the House of Lords. Nor were the facts *disputed* by an interest represented before the same Committee, who had every inducement to do so, if they could be sustained in it.

§ See Appendix of the above work, vol. ii. Misled by the title on the *cover*, I have nowhere before given the proper designation to Mr. Bischoff's work. Wherever the authority of this gentleman is given you will understand that it is derived from the work just named. Published London, 1842.

and therefore indicates, as well as the case admits of—home manufactures remaining the same—the rise or decline of wool-growing, in the several nations, for the period indicated.

It will be seen from the above, that Spain, (and we may include the whole Peninsula,) once so famous for her wools, has sunk to a fifth or sixth rate wool-producing country, and that her exports are still constantly declining; that Germany and Prussia have reached their climax, and are on the wane; that Russia, Italy, Australia and the East Indies are the most rapid increasers.

The high prices of land and provisions—nearly double those on the Continent* (far more than double those on many portions of it)—the onerous general taxes and parochial assessments, will not allow wool to be grown in England for its own sake. The sheep must be reared, as a matter of pure necessity, to sustain her present system of convertible husbandry. A sheep fitted for that object, and to make the most meat in the shortest time, is the main desideratum. Wool is but a secondary consideration. None but the coarse, early maturing breeds will, therefore, ever be grown there. Unless some great revolution should take place in her Agriculture, these are not likely to ever materially increase or diminish from their present number. If any effect is produced on this husbandry by the abolition of the Corn-Laws, I think it will be to diminish rather than increase the number of sheep.

France, especially in some of her Southern Provinces, is admirably adapted to Sheep Husbandry. In 1825, the number of sheep in the Kingdom was estimated to exceed 30,000,000, but it is supposed to have materially diminished since that period, by reason of the division of landed property, and other causes.† With a population variously estimated from 163½ to 168 to the square mile,‡ a soil a fair portion of which is well adapted to the growth of bread-stuffs, and the remainder to the vine, fruits, the mulberry (for silk), etc., France finds it better economy to cultivate these, and draw a considerable portion of her supplies of wool from other countries—her fine wools from Germany and Spain, her coarse ones from the regions bordering on the northern shores of the Mediterranean, the Gulf of Venice, and the Black Sea. France exported 84,799 lbs. of wool, costing less than 7 cents a pound, to the United States in 1846.‖ This small amount might have been of her own growth, or derived from her transit trade. By the statistical Tables appended to his description of France, by Malte Brun, it appears that of the 51,777,000 hectares§ which he estimates to comprise the surface, 22,818,000 are in arable land, while the entire extent of meadows and pastures (which are divided about evenly) but little exceeds 7,000,000 hectares.¶

Spain, it appears from the Table, now exports less wool to England than Italy or Russia! and is still (as late as 1840) on the decrease. This is not owing to the increase of her manufactures,** or by a diversion of her exports into other channels. The export to France would, undoubtedly, show a similar falling off. That to the United States is but nominal. In 1836 it was but 20,730 lbs.,†† and as this was wool costing less than 7 cents per pound, and came from the Mediterranean side of Spain, it was probably in her ports merely *in transitu*. The Gibraltar trade, given in the Table, I take to be exclusively or mainly a transit one. From the *Balan-*

* See Circular of John Maitland and others, Committee of the Woolen Trade in London—Bischoff, vol. ii., p. 33.

† Bischoff, Youatt.

‡ Mitchell assumes the former, and Morse the latter to be the population.

‖ Report of Secretary of the Treasury, 1846.

§ A hectare is 2 acres 1 rood and about 35·4 rods.

¶ Malte Brun, Am. ed. vol. iii., p. 1039.

** Spain is not estimated to manufacture more than one-twentieth of the woolens consumed by her. Encyclopædia Amer., art. *Spain*.

†† Report Secretary Treasury, 1846.

za Mercantil,* published by the Government, it appears that the exports of Spain of all kinds, in 1826, amounted to only £1,587,507. The exports of raw and manufactured silk and gut reached £243,390; lead, £215,360; wines, £189,340; wool, £161,650; fruits, £152,075; brandy, £107,715; barilla, £79,200, etc. This exhibits not only the smallness of the entire export of wool, but the diminished *comparative* importance of this once great national staple.

The number of sheep in Spain is still placed by many writers as high as 10,000,000 for the migratory flocks, and 8,000,000 for the stationary ones. Even Mr. Youatt has fallen into this, as it strikes me, unquestionable error.† If Spain possesses 18,000,000 of sheep, what does she do with the wool, which should amount to at least 54,000,000 lbs.? Admitting—which probably exceeds the fact—that her export to France and other nations equals that to England, and that she manufactures a quantity equal to twice her whole export, the aggregate amount would be less than 8,000,000 lbs. The author of the article on Sheep Raising in the Encyclopædia Americana, places the number of the whole fine-wool sheep in Spain at 4,000,000. This I think high enough, and probably not far from the truth. This is a million less sheep than those of the State of New-York in 1839!

The actual facilities for growing wool in Spain have already been alluded to in my fifth Letter. I should not consider it necessary to bestow farther examination on them, were it not for the fact that owing to various associations connected with the early history of the Merino sheep, and the lead once taken by Spain in the production of fine wool, her facilities have been, popularly, prodigiously overrated, and even the difficulties under which she has labored for this husbandry, magnified into advantages. Her northern mountains are high, broken, cold, and exposed to peculiarly piercing north winds,‡ and the winter on them lasts, as I infer from Mr. Livingston, about six months. He says:‖

"When the severe weather commences on the mountains, the shepherds prepare to depart, which is generally about the end of September and throughout the month of October, to seek more temperate climates and fresher pastures. In April or May, according as the season is late or early, they return to the mountains."

It *might* be practicable to prepare hay for winter use, in favorable positions, and particularly on the *parameras*, on these mountains, and thus the migratory sheep might become stationary on them. But the Spaniard is too much wedded to ancient customs, too little in love with change of any kind, and, most of all, a change bringing an addition of *labor*, to thus innovate on his own habits or those of his flocks.

The high basins of the Douro and Tagus (embracing the two Castiles and Leon) are too valuable for the cultivation of grain, vineyards, fruits, etc., to be profitably devoted to the pasturage of sheep. The wheat of Spain is among the best in Europe,§ and it is stated in Mr. Jacob's *Tracts on the Corn Trade*, that she frequently does not raise enough for her own consumption.¶ For the vine, olive, fig, mulberry, barilla, and various other products of equal profit both for home consumption and for export, she is not excelled probably by any country in Europe. A friend of mine who traveled in Spain in 1845, describes the valleys above alluded to, as almost exclusively devoted to tillage crops. In the Southern Provinces,

* Quoted by McCulloch—Com. Dic., art. *Cadiz*.
† See Youatt on the Sheep, Lond. ed., p. 147 *et supra*. Mr. Livingston in his day estimated the migratory sheep at 5,000,000, the stationary at 8,000,000. See Essay on Sheep, pp. 36, 39. Mr. L. was also undoubtedly in error.
‡ Malte Brun.
‖ Livingston on Sheep, p. 36.
§ Note by Percival to Am. ed. of Malte Brun; art. *Spain*.
¶ Quoted by McCulloch—Com. Dic.; art. *Odessa*.

where rain does not sometimes fall for months in the summer,* the grass becomes entirely dried up, so that flocks, to be made stationary there, would require hay or other prepared food for several of the summer months!

The *Transhumantes* or migratory flocks must still continue, then, to travel from the northern mountains to the warm basins of the Guadiana and the Guadalquiver for their winter quarters, and return to the mountains in the summer, or this branch of the husbandry would undoubtedly become extinct. The effect on the health and condition of the sheep, and the important item which it would form on the debit side of the account in Sheep Husbandry, to thus drive flocks a six weeks' journey twice a year, (consuming nearly *a quarter of the year* on the road,) can be estimated by any one acquainted with such matters.† The losses and expenses thus incurred would absorb all the profits of the husbandry, were it not for the extraordinary privileges conferred on the flockmasters (mainly consisting of the King, nobles and clergy) by the absurd and tyrannical regulations of the *Consejo de la Mesta.*‡ The abolition of the "Council of the Royal Troop," there cannot be a reasonable doubt, would be immediately followed by the downfall of the migratory Sheep Husbandry in Spain. That the day has gone by when this unfortunate and distracted country can ever again enjoy the blessings of permanent peace and settled institutions, under which this or any other branch of husbandry can increase or steadily flourish, until she reaches a point of political civilization entirely incompatible with the continuance of a relic of tyranny and barbarism so monstrous as the *Mesta*, I consider equally certain. I see, therefore, no possible, or at least probable contingency under which the migratory Sheep Husbandry of Spain is likely to be extended, or even to permanently maintain its present footing. Nor is there any probability of her again rising into importance as a wool-producing country, from her stationary flocks.

Italy, though too accessible to the dry, hot wind of Africa, (the *Solano,)* to exhibit the uniformity of deep-green verdure seen north of the Alps, is nevertheless—much of it—a country of fine pasturage. The great plain between the Alps and Appenines, the basin of the Po—including Lombardy, Sardinia, Parma, Modena, etc.—is one of the most productive in Europe, and its extraordinary facilities for irrigation allow five or six crops of hay to be mown in a single season. In Tuscany, the orange and lemon begin to make their appearance—the soil is alluvial and rich, and the mountainous districts are finely adapted to pasturage. The States of the Church are also highly fertile, and abound in good herbage; and on the deadly *Campagna di Roma*, and even the Pontine Marshes, flocks and herds find an abundant subsistence in winter, and are driven to the Appenines in summer. The same remarks apply to the northern portions of the Kingdom of Naples. The southern extremity of Italy is exposed to a burning climate, and exhibits the vegetation of Africa.

The whole superficial area of Italy does not exceed 122,000 square miles, and her population is 172 to the square mile. Scarcely raising bread-stuffs enough for her own consumption, taking one year with another,‖ there is not the most remote prospect of her ever becoming an important wool-exporting country.

* See Hon. Wm. Jarvis's Letter to me on the subject of Merino Sheep, when I acted as Corr. Sec'y of the N. Y. State Agricultural Society—Transactions, 1841, p. 322.

† Since giving this as the distance from "the middle of Estremadura to the Cantabrian Mountains" (Letter V), I see it stated in the Encyclopædia Americana that "the whole journey from the mountains to the interior of Estremadura is reckoned at about 690 miles." Measurement on the map will show that it does not exceed 4 degrees or 277 miles, but the difference may be made by the circuitousness of the route, or the writer may refer to more eastern portions of the great Appenine Chain. I find it stated by several writers that each journey consumes six weeks.

‡ For a description of this odious tribunal see Livingston on Sheep, p. 35.

‖ See McCulloch's Com. Dic.; art. *Odessa.*

Turkey both in Europe and Asia, it would appear from Table 8, is but a trifling exporter of wool. It should be remarked, however, that the wools of the Western Provinces, and of Greece, are generally exported from Trieste to France.* Under the late American Tariff, ("Tariff of 1842,") the export to the United States was becoming an important one—much greater than that to England. In 1846, it amounted, of wools costing less than 7 cents a pound, to 5,744,328 lbs.† European Turkey has a colder and less uniform climate than Italy, but still it is a fine one,‡ and being a broken, mountainous country, well adapted to pasturage, and but sparsely populated, (55 to the square mile,) it is wonderful that so little attention has been paid to the culture of wool. But the proud and indolent Turk spurns all rural labor, or all interest in it, leaving it to his vassals—and these, destitute of any security to person or property, taxed, oppressed, liable to be compelled to make forced sales to bey or ayan—or, what is worse, their property seized outright—have little inducement to accumulate a species of property so easily pounced upon.‖

Germany (including Prussia and Austria) is now the great producer of fine wools, supplying not only her own manufactories—which are estimated to consume half the whole product—but exporting the large surplus indicated in the Table. Nor is this all; for to France, the Netherlands, Switzerland, &c., she is supposed to export half as much as to England.§ The whole region thus included—leaving out the Austrian States in Italy, which have already been considered—comprises a territory of 468,000 square miles, and a population of 58,800,000, or 130⅔ to the square mile. The country on the north is level, vast plains extending from the declivities of the mountains which occupy the center of Germany, to the North Sea and the Baltic. The center is mountainous, and its plains are very elevated. The extreme South is covered with mountains. From the Little Carpathian or Jablunka Mountains, and from the eastern termination of the Styrian and Julian Alps, stretch away the vast Hungarian and Transylvanian plains to the confines of Turkey.

The great northern plain of Germany is low, sandy, flat, often consisting of naked silicious sands or those covered with lichens, interspersed with frequent marshes, and terminating in many places on the Baltic in vast morasses, or land redeemed from the sea by dikes. As a whole, the land, particularly in the maritime Provinces, is of an inferior quality, but some portions of it, as for example in Silesia and Saxony, is of a quality ranging from medium to good. The soil of Central and Southern Germany (including Austria) must, of course, exhibit many varieties. In general, however, it may be set down as productive in the valleys, and ordinary or poor on the high lands. The lower plains of Wirtemberg, Baden, the South of Bavaria, etc., are exceedingly fertile. The plains of Hungary on the south-east not uncommonly exhibit soils of remarkable richness, but they alternate with inferior ones, and with vast and unhealthy morasses. Taken together, the region which I have included under the designation of Germany, though not a sterile country, is not favored with soils naturally as productive as those of Italy or Spain; nor would it at all compare with that portion of the United States west of the Apalachians.

The climate of Germany is thus summed up by Malte Brun:¶

* Southey, quoted by Bischoff, vol. ii. p. 356. † Report of the Secretary of the Treasury, 1846.

‡ For a picture of this as well as the other natural features of Turkey, both in Europe and Asia, Greece, and the Ionian Isles—as delicately accurate, as soft and rich as one of the scenes of Claude—see Childe Harold, Canto II., the opening of the Giaour, the Bride of Abydos, etc. Though this may be deemed a singular, it is the *very best* reference, which my reading enables me to make.

‖ See Urquhart on Turkey and its Resources, p. 139. § Encyclopædia Americana; art. *Wool.*

¶ Am. ed., vol. ii., p. 594.

"The climate of Germany is greatly modified by the elevation and declivities of the country; but independently of that cause, it does not admit, from its extent in latitude, of any vague or general definition. It may be divided, however, into three great zones, and these, too, are susceptible of other subdivisions. The first is that of the northern plains, of which the temperature is not so cold as it is humid and variable; they are exposed to every wind, while fogs and tempests are conveyed to this region from two seas. The north-west plain is subject, from its vicinity to the North Sea, to frequent rains and desolating hurricanes. The influence of the Baltic on the north-east plain is less powerful; the climate, though colder, is not so humid and variable.

The second general zone comprehends all the central part of Germany. . . . . The mountains in that extensive region form a barrier against the effects of the maritime climate. The sky is not obscured by mists, and the regular order of the seasons is not interrupted by winds and tempests; but the elevation of the soil renders the climate colder than in other countries in the same latitude nearer the level of the sea. . . . . The third general zone is that of the Alps. The lofty hights and rapid declivities connect very different climates; thus the culture of the vine ceases in Bavaria and Upper Austria, and appears anew with fresh vigor in the neighborhood of Vienna. The eternal glaciers of Tyrol and Salsburg are contiguous to the valleys of Styria and Carniola, covered with fields of maize or vineyards, and almost border on the olives of Trieste and the lemon-trees of Riva."

Contiguous mountains render the north of Hungary extremely cold. Farther south, the climate rapidly becomes warmer, and on the lower plains in the extreme south the heat is intense and the climate insalubrious.

The *bauer* or farmer in those States of Germany where the feudal tenures have been abolished, and the land is held in fee simple, owns four or five English acres of land. These men, says Mr. Jacob,

"although placed above the pressure of want, or possessing the bare necessaries of life, have very little beyond them. Such as are industrious and frugal, by cultivating their small portion of ground, may raise a sufficient quantity of potatoes for their own consumption, corn for their bread, and provisions for two draught oxen. They all raise a small quantity of flax, and some few *contrive to keep five or six sheep.* It is often no easy matter for those to find occupation, who are desirous of other employment in addition to the cultivation of their own land, for no agricultural labor can be carried on during the long and severe winters. . . . It is rare indeed that they can afford to have meat of any kind, and those only who are more prosperous than their neighbors can keep a cow to provide themselves with milk."

The wool raised by these owners of five or six sheep, is annually bought up by Jews and other traveling agents, who go from house to house to collect it.

The following extracts from William Howitt's sprightly and interesting "Rural and Domestic Life in Germany" will show under what circumstances a great portion of its wool is grown:

"Here you look in vain for anything like the green fields and hedge-rows of England. . . . It is all one fenceless and plowed field. Long rows of trees on each side of the road are all that divide them from the fields. . . . . The keeping up of the cattle presents you a new feature of rural life. As the quantity of land left for grass is very small, the grass is proportionably economized. The little patches of grass between woods and in the open parts of the woods, the little strips along the river-banks and even in gardens and shrubberies, are carefully preserved for this purpose. You see women in these places cutting grass with a small hook or smooth-edged sickle, and carrying it away on their heads in baskets for their cows. You see the grass on the lawns of good houses, on grass-plats, and in shrubberies, very long and wild; and when you ask why it is not kept closer mown, the reply is that it is given to the milk-woman, often for a consideration, who cuts it as she wants it. You see other women picking the long grass out of the forests, or under the bushes on the hill-sides where the slopes have been mown, for the same purpose. . . . . The children may be seen standing in the stream in the villages carefully washing weeds before they are given to the cattle. . . . . Nettles, chervil, cow-parsnip, which in England are left to seed and rot, are all here cut for the imprisoned cow. You go down to the river-side to fish, and a peasant is soon with you, chattering and gesticulating, pointing to your feet and to the grass. It is to let you know that you are not to angle there, because it treads down the grass; and accordingly, in Germany, with rivers full of fish, you seldom see an angler; if you, he is pretty sure to be an Englishman. . . . . Not a sheep, a horse, or a cow is to be seen. . . . The mountain tops are covered with wood. The slopes are covered with vineyards. You ask where the cattle are? You are answered, in the stalls. Where are the sheep? Under the care of shepherds, somewhere—Heaven knows where! you never come across them. It is only on the great

plains of the North that you afterward find large flocks and herds, under the care of keepers, kept close together; for as they have no fences, they are under the momentary peril of making ravages on their neighbor's crops."

Between Leipsic and Berlin, on the plains of Saxony, Mr. Howitt first saw flocks of sheep in the field, and he says:

"One thing which surprises an Englishman is to see what wretched creatures are the sheep which produce the famous Saxony wool. . . . . In fact, it is a prevailing idea that the leaner the sheep the finer the wool. It is the wool to which all the attention of the grower is devoted, and therefore, generally speaking, a more miserable assemblage of animals than a flock of German sheep is not to be seen. . . . . On the plains they wander under the care of a shepherd, and for the most part on fallows and stubbles, to pick up odds and ends, rather than to enjoy a regular pasture. You may see them penned on a blazing fallow, where not a trace of vegetable matter is to be seen, for the greater part of a summer day, which in this climate is pretty much like being roasted alive. . . . . For what purpose they are here, except to starve and melt them into leanness, I never could discover. . . . . The sheep, besides being lean, are generally dreadfully lame with that pestilent complaint the foot-rot, and their keepers, apparently, trouble themselves very little about it."

Mr. Howitt states that it is necessary to economize the land so closely, to sustain the population, in some parts of Germany, that the peasants actually convey earth up steep hill-sides in baskets, and cover the rocks with it, to thus add to the tillable soil!

In reviewing the preceding facts, you are struck with no one which would indicate particular natural advantages for sheep rearing in the States of Germany, Prussia, and—with an exception presently to be named—Austria. The climate of the North is humid, fickle and tempestuous; that of the middle cold with long winters. Neither possess any advantages over our own *Northern* States—and in some respects are decidedly inferior to them. This was the opinion of that eminent sheep-breeder and excellent man, Henry D. Grove, of this State, who was a native of Prussian Saxony, and who certainly would never be suspected by any one who knew him personally, of any want of partiality for anything pertaining to his *Fatherland!* In his letter to Benton and Barry on wool-growing, &c., he says:

"Ten years' experience has fully satisfied me on this point. In some respects, we possess natural advantages over Germany."

In what particulars he awarded the preference to the United States, his letters and oral declarations to me, leave no uncertainty. It was both in *soil* and *climate*, and in instituting the comparison, he had his eye not on the most favored sections of our country, but on the hills of Rensselaer County in this State, where he resided.

If in *natural* advantages we surpass Germany, how much more we do in *artificial* ones, may be estimated from the preceding extracts from Messrs. Jacob and Howitt. To these general remarks portions of Hungary form an exception. In these, the climate is fine, the soil rich, and, the feudal tenures remaining unabolished, the land is yet held in those large estates so favorable to Sheep Husbandry. Prince Esterhazy, the former Austrian Ambassador to England, says Mr. Paget,* owns an estate of something more than 7,000 square miles, including 130 villages, 40 towns, and 34 castles. His sheep are said to amount to 3,000,000.† Other nobles own flocks of from ten to thirty thousand. The demi-savage Magyar serf, whose labor costs nothing, whose principal garment is a sheep-skin, and whose miserable and scanty food is more than half stolen,‡ makes a most *economical* shepherd! Hungary lacks facilities for internal communication, and her convenience to the Mediterranean markets—excepting Turkey—so as

* Paget's Hungary and Transylvania, vol. i. pp. 46. † Youatt.
‡ See Paget's Hungary, &c., p. 13 to 19.

to first throw her agricultural products into ports where the demand is good, is decidedly inferior to that of Italy, France and Spain. The Danube is the only natural outlet to her commerce—which, thanks to a liberality of policy on the part of Turkey,* contrasting most favorably with that of several *enlightened* nations† under similar circumstances, she enjoys without limitation. To reach Trieste, a long land carriage is indispensable. Her exports too, are embarrassed by the imposts and narrow restrictions of the Imperial Government. She cannot, therefore, export cheap heavy articles, such as provisions, to so great advantage as the Levantine nations: but every circumstance points to her as a country which should be one of the first on the Eastern Continent, for the production of wine, silk, wool, &c.

Separated from Hungary and Transylvania only by the Carpathian Mountains and Turkish Moldavia, lie the fertile provinces of South-eastern Russia, the basins of the Dniester, the Dnieper, and the Don. From the Carpathians to the Caspian, across the entire extent of the plains of ancient Scythia, not an elevation which could be properly dignified with the appellation of a mountain, breaks the immense expanse! The lower valley of the Dniester or Borysthenes, formerly known as the Ukraine, has been celebrated for centuries for its pasturage—for its horses ‡ and cattle: and recently flocks of Merino sheep have been introduced there and successfully crossed with the native variety. In 1839, Mr. Slade states that many of the colonists on the Steppe and in Bessarabia had 20,000 sheep. Merinos were introduced into Crimea or Taurida, by M. Rouvier, a French adventurer, in about 1802.|| In this favored peninsula, which the learned Pallas describes as little less than an earthly Paradise, they have multiplied exceedingly, and extended to Cherson, Ekatherinoslav, Bessarabia and other provincial Governments.§ The export of wool from Odessa in 1829 was 3,402 lbs.; in 1830, 21,361 lbs.; in 1831, 35,058 lbs.; in 1832, 41,558 lbs.; in 1833, 66,457 lbs.; in 1834, 66,901 lbs.¶

In one respect Southern Russia has the advantage over Hungary. It is more sparsely populated, and land is perhaps in still lower estimation. As in the latter, the land, much of it, is fertile and well adapted to pasturage, and the price of labor is next to nothing. But for causes adverted to in the opening part of my eighth Letter, there is a wide disparity in the climates of the two countries, if we leave Crimea out of view. That of Russia, affected by the north and north-east winds—which the Carpathians exclude from Hungary—has a winter which for length and intensity is entirely unequaled in the latter, excepting in its northern mountainous regions. Sheep must be housed, and fed for some months on dry food, in Southern Russia. Taking into view the broad, level *steppes*** and their luxuriant natural verdure—taking into view the climate, warm in summer, cold and exposed to winds of great severity in winter, it strikes me that there must be no inconsiderable resemblance between this portion of Russia and our own north-western prairies in corresponding latitudes (45° to 46°). But when the cost of land and labor is taken into consideration, wool can be produced cheaper, in my judgment, in South-western Russia than in Spain, France, Germany, Italy or any other portion of Europe, excepting Hungary. Were

* This power is remarkable for its liberality in all its regulations which affect the trade and commerce of other nations.

† *e. g.*, the policy of England in relation to the navigation of the St. Lawrence.

‡ This wild region and its horses have been rendered classic by Mazeppa. Who, that ever read, has forgot the description of the horse on which the Hetman performed his fiery and perilous ride!

|| For an interesting account of the adventures of this fortunate French Jason, see Slade's "Travels in Germany and Russia," published London, 1840.

§ See Slade's Travels; also McCulloch's Com. Dic.—*art.* Odessa.

¶ McCulloch's Com. Dic.—*art.* Odessa.

** This Russian word has a similar signification to *prairie, pampas, llanos*, &c.

European Turkey differently populated, and under different institutions, it might constitute another exception.

Central and Northern Russia, like the States north of Germany, are north of the wool zone. Their winters are too long and severe to allow them to compete with regions lying farther south, in wool-growing.

Asia Minor, or Turkey in Asia, and Persia have been alluded to—the former, much of it, a fine country with a most delightful climate, but its natural advantages all neutralized by its political systems and the character of its population—the latter, except in occasional favored positions, such as the valleys of Shiraz and Ispahan, a land of mountain and desert, of intense heat and intense cold.

Independent Tartary, lying immediately north of it, is less exposed to the hot winds of Arabia, but more so to the freezing ones of Siberia. Its vast dry plains are usually deserts, excepting on the borders of its exceedly rare streams. Great Bucharia, however, in the south-east, on the head waters of the Amoo (Oxus)—from the Capital of which Timour (Tamerlane) issued on his desolating path of conquest—is a country of great fertility. Its natural beauties constitute a favorite theme with the poets and geographers of Persia and Arabia. Since the opening of the navigation of the Indus, it has annually sent some wool to Bombay, which constitutes a part of that which is shipped thence to England, and is known in Table S as East Indian wool.

Afghanistan and Beloochistan, protected on the north from the Siberian winds by the lofty Hindoo Koosh mountains, and less exposed on the south to those of Arabia, exhibits a milder and less variable climate than that of the conterminous regions of Persia. Among the Highlands of the north, and those skirting the Indus on the east, there is much good pasturage. Sir Alexander Barnes states that four-fifths of the whole surface of Cabul, a Province of the former, is excellent pasture land. The wool of the broad-tailed sheep of these countries also finds its way, by the Indus, to Bombay, and is classed as East India wool in the Table.

From the high, cold, mountain regions of Thibet, Little Bucharia, &c., some wools are exported, through the same channels, which come under the same classification. These countries also export shawl wool.* Most of China north of the great Desert of Cobi is a cold, mountainous country. The southern portion, or China Proper, is too densely populated and closely cultivated to be devoted to pasturage.

The wool trade which followed the opening of the Indus (the raw material being supplied by Afghanistan, Great Bucharia, Thibet and some of the Hindostanese Provinces) might doubtless be swelled into one of great importance, particularly by introducing finer breeds of sheep; but we can scarcely expect this, from what we know of the habits, agricultural and commercial, of the population. Among constant political changes wrought by the only Asiatic argument—the sword—the personal habits and occupations of the Asiatic remain ever the samo, and are, perhaps, the best type of persistency to be found in anything short of immobile matter. Indeed, the stony features of the Sphinx have changed scarcely less through revolving generations, than have the ethnic ones of this great family of the human race!

Let us now pass to those regions of the Old World, south of the Equator, included in the wool-growing zone.

The southern extremity of Africa—the Cape of Good Hope—is included

* The table-land of Thibet is elevated 15,000 feet above the level of the sea. Mr. Trail remarks that every animal here, including Carnivora, produce that down under their hair which is known as *shawl wool*—though that manufactured comes mainly from a species of goat.

in the wool-growing zone. The following description of it is by Rev. Robert Moffat, for twenty-three years a resident of it as the agent of the London Missionary Society :*

"The Colony extends from west to east about six hundred miles, its average breadth being about two hundred. . . . . Between the coast and the vast chain of mountains, beyond which lie the Karoo, the country is well watered, fertile and temperate. The other portions of the Colony, with few exceptions, and without a change in the seasons, appear to be doomed to perpetual sterility and drouth. The Karoo country, which is in the background of the Colony, is, as Lichstenstein correctly describes it, a parched and arid plain, stretching out to such an extent that the vast hills by which it is terminated, or rather which divide it from other plains, are lost in the distance. The beds of numberless little rivers, (in which water is rarely to be found) cross, like veins, in a thousand directions, this enormous space. The course of them might, in some places, be clearly distinguished by the dark green of the mimosas spreading along their banks. Excepting these, as far as the eye can reach, no tree or shrub is visible. . . . . But even on these hills and sunburnt plains thousands of sheep pasture on a thin sprinkling of verdure and esculents. . . . . The entire country, extending in some places hundreds of miles on each side of the Orange River, and from where it empties itself in the Atlantic, to beyond the 24th degree of east longitude, appears to have the curse of Gilboa resting upon it. It is rare that rains to any extent or quantity fall in those regions. Extreme drouth continues for years together. The fountains are exceedingly few, precarious, and latterly many of these have been dried up altogether."

According to Barrow, nearly seven-tenths of the Colony are destitute of vegetation during a greater part of the year. Sand drives before the winds, exercising an unfavorable influence on sheep and wool. Lions, tigers, wolves, hyenas, jackals, wild dogs, etc., are numerous on the very skirts of the settlements, making much vigilance necessary for the protection of the sheep; and they must be nightly driven into the settlements to be folded. But the natives have proved a vastly more destructive enemy than these.† The sheep introduced by the English colonists will probably eventually considerably increase beyond their present number in a country of so great extent, but we are scarcely authorized to believe that the Cape will ever take a high rank among the wool-producing countries of the world.

That great island, or continent, known as New South Wales, or Australia, has a superficial area equaling that of the United States. But a limited portion of it, however, is included in the wool zone. All of Van Diemen's Land, or Tasmania, is in that zone. The export of wool from these countries, as will be seen from the Table,‡ reached nearly ten million pounds in 1840—nearly half that of Germany, including Austria and Prussia, and almost *eight times* that of Spain! Here, as at the Cape of Good Hope, there are no woolen manufactories, and being Colonies of England, their export to that country exhibits their *whole* production.

The soil, products, &c. of Australia are thus spoken of by Mr. McCulloch :||

"The fertility of the soil in most parts of New-Holland that have been explored with any care, is very far indeed from corresponding with the glowing descriptions of some of its casual visitors, whose imaginations seem to have been dazzled by the magnificence of its botanical productions and the clearness and beauty of the climate. The truth is that the bad land bears a much greater proportion to the good in New-Holland than in almost any other country with which we are acquainted. . . . . Of course it is not to be supposed but that in a country of such vast extent there must be some fertile districts; but along the east coast, with which we are best acquainted, these seem to be much more confined than might have been expected; and the little experience we have had on the west side, at Swan River and other places, does not seem to lead to any more favorable conclusions."

After stating that if the Government price of lands "is not a great deal

* Missionary Labors and Scenes in Southern Africa, pp. 23—24. † See Letter V., and Note.

‡ Including Port Philip, Swan River, and South Australia, the exports of which are carried out separately in Table 8.

|| McCulloch's Com. Dic.—*Art.* Sydney.

above the mark in New-Holland, it must be a great deal below it in Upper Canada," Professor McCulloch continues:

"If the Americans exacted the same price for their public lands that we do, something might be found in favor of extending the principle to Canada. They, however, do nothing of the sort, but sell much better land at a decidedly lower rate. . . . . If slaves could be imported into a Colony of this sort, there might be some chance of its succeeding. But while land of the very best quality may be had in the Valley of the Mississippi for about a dollar an acre or less, we think better of the common sense of our countrymen than to suppose that any one able to carry himself across the Atlantic will resort to Australia."

Of the climate he says:

"The climate of such parts of New South Wales as have been explored by the English is particularly mild and salubrious. . . . . On the other hand, however, it has the serious defect of being too dry. It seems to be subject to the periodical recurrence of severe drouths. These prevail sometimes for 2, 3, or even 4 years together. The last 'great drouth' began in 1826, and did not terminate until 1829. Very little rain fell during the whole of this lengthened period, and for more than six months there was not a single shower. In consequence, the whole surface of the ground was so parched and withered that all minor vegetation ceased; and even culinary vegetables were raised with much difficulty. There was also a pretty severe drouth in 1835. This is the great drawback of the Colony; and were it more populous the drouths would expose it to still more serious difficulties."

Another drouth occurred in 1841, and Mr. Hood thus describes its effects on the sheep:*

"It will be scarcely believed in England that the estimated number of sheep which have died within the last twelve months in the Colony from catarrh and drouth is 70,000!! that colonists are compelled in order to save the dam from starvation, to cut the throat of her lamb; that no means are adopted for securing a stock of lambs for next year; or that a stockholder would offer 8,000 sheep to any one that would remove them from his runs, and finding that no one could be prevailed upon to taint his own flocks by accepting so dangerous a present, had recourse to consuming them by fire, and had actually killed and burnt 2,000." . . . .

Of the country Mr. Hood remarks:

"The first object on the arrival of every settler should be to procure a good country for his flocks, and this, I have elsewhere said, is his grand difficulty. Let him be wary on this point. Almost every desirable or habitable spot in the old countries, as the early settled districts are called, is already occupied."

Some diseases seem to be peculiar to the country, or, rather, peculiarly inveterate in it. Mr. Youatt says:†

"The sheep frequently suffer from the wild and poachy nature of a considerable portion of the pasture. The foot-rot seems to assume a character of its own. . . . . If neglected, it speedily becomes inveterate and preys upon and destroys the animal. The losses occasioned by it in the early existence of the Colony were frightful."

The astringency of the water and other causes have produced severe epidemics. In some years, some of the flockmasters have lost half of their sheep.‡ The scab is a prevailing disease, and Doct. Lang says:‖

"When a convict shepherd has a pique against his master, or even against his overseer, it is often in his power to subject the whole of his master's flock to this obnoxious disease, merely by driving his own flock a few miles from their usual pasture, and bringing them into contact with a diseased flock. The chief source of the wealth and prosperity of the Colony is thus, in a great measure, at the mercy of the most worthless of men."

The cost of both land and labor is comparatively (*id est*, compared with the unoccupied lands of the United States) high. The Government minimum is 5s. ($1 15) per acre, but very little if any good land is sold at that price. Mr. Hood states that the portion of Capt. McArthur's immense estate which was obtained by purchase, cost, on the average, 7s. 6d. ($1 72½) per acre. Shepherds receive from £15 to £20 ($69 to $92) with

* Quoted by Spooner in "History, Diseases, &c., of the Sheep." London, 1844, p. 67.
† Youatt on Sheep, p. 189.
‡ See Spooner, pp. 417–421.
‖ Lang—Historical and Statistical Account, vol. i., p. 351.

a *house and rations*, per annum; overseers of a superior description £50 to £60 ($230 to $276),* also with a house and rations.†

The sheep are exposed to the depredations of various animals, but the wild dog is their most dangerous enemy, with the exception of the *run-away convict*. The sheep are therefore folded nightly, guarded by a watchman with his dogs, and with a fire to scare away the wild beasts.‡ One shepherd usually takes care of about 300 sheep, and "in the more sterile parts of the Colony, *where three acres of the uncultivated ground are scarcely sufficient for the support of one sheep*, the labor is very severe."‖

Mr. Samuel Lawrence recently wrote me:

"I saw a gentleman from England a few months since who has an admirable flock in New South Wales, of twenty-five thousand sheep, and he assured me he had not received a penny of income from them since 1838."

Van Diemen's Land (containing 28,000 square miles) is claimed by Mr Youatt§ to be superior in several respects to Australia as a wool-growing country. Table 8 does not, however, show that its exports increase any more rapidly.

Both of these Islands, as colonies of Great Britain, send their wool to the latter duty free, and they save 1 cent per pound on wool costing less than 24 cents, and 2 cents on that exceeding that value. But this by no means offsets against the additional cost of freight, over that exported from the United States, Hungary, or the south of Russia. While it is only 3,375 miles from New-York to London, it is not less than 13,000 miles from Sydney or Hobart's Town to the latter place. Professor McCulloch states (art. *Sydney*) that the expense of conveying a passenger to Sydney is about three times that of conveying one to Quebec. I see no reason why a corresponding difference should not exist in the freights; and in that case, freights from the United States would be two-thirds less than from Australia.

I pretend, Sir, to no power of vaticination on this subject, but the conclusions which *I* draw from a review of all the foregoing facts are as follows:

1. That wool-growing is never likely to permanently and importantly¶ increase in any of the countries of Europe, unless it be in Hungary, Turkey, and the south of Russia.

2. That it is more likely to decrease than increase in Great Britain, France, Portugal and Italy.

3. That such a decrease is next to certain in Spain and Germany, (including Prussia and Austria in the latter,) excepting Hungary and Transylvania; that the decrease will be much more considerable in Germany; that its rapidity and extent will be proportioned to the rapidity and extent with which the market is supplied from countries which can grow wool cheaper, such as North and South America, Hungary, Southern Russia, and Australia.

4. That wool-growing will undoubtedly largely increase in Hungary and Southern Russia—and that it *ought to* in European and Asiatic Turkey, but will not, extensively, until the character of the people and their political institutions are changed.

5. That it will also increase at the Cape of Good Hope, Australia and Van Diemen's Land; but that its economical extension in either of these countries is limited, especially if America becomes a competitor.

* Calling the English shilling 23 cents, according to Report of Director of U. S. Mint, 1827.
† Report of a Committee, &c., quoted by Mr. McCulloch—Com. Dic.; art. *Sydney*.
‡ Cunningham's Two Years in New South Wales, vol. i., p. 254.
‖ Youatt on the Sheep, p. 188. § *Quem vide*, p. 190.
¶ I say "importantly," because Sweden, Norway, Denmark, &c., in that spirit of rendering themselves independent of *foreign* supplies, which characterizes all nations, may, and probably will extend their wool culture; but it will be too unprofitable a struggle against Nature, to be carried to a very great extent.

6. That no part of the Eastern Continent or its islands, all things considered, possess equal advantages for wool-growing with some parts of the United States. 1. The climate of many portions of the latter (in the South) is not excelled by that of the most favored situations in Hungary or Australia; and in this respect it is decidedly superior to the south of Russia. 2. The soils of vast sections of the United States, with the above climate, are more *uniformly* fertile and adapted to pasturage than those of either Hungary or Southern Russia—and, as a whole, are entirely superior to those of Australia. 3. The regions alluded to in the United States, are better watered with running streams than either of the other named countries—have not the vast and unhealthy morasses of Hungary—and are not subject to the destructive drouths of Australia. 4. The land is cheaper in the United States than in Australia, and (my impression is) than in Hungary or Southern Russia; and, in the Southern States, labor costs no more than in the two latter, and far less than in the former. 5. In accessibility and nearness even to the great *European* wool market, the United States stand on equal terms, at least, with Hungary and Southern Russia, and the distance from Sydney (in Australia) to London is nearly *four* times the distance from New-York to London. 6. In *no respect* do either of these countries, the most favored in the Old World, excel, in my judgment, for the purposes of Sheep Husbandry, large portions of the United States; and I believe those portions of the United States can sell wool in the English market at a better profit on all the capital invested than either of the above countries, with the possible exception of the most favored portions of Hungary.

Our surplus wools can, therefore, at any time, be exported to England at a *reasonable* profit. This is true, even of wools grown in the Northern States. In 1845, the United States exported wool, (mainly to England,) to the value of $22,153; and in 1846, to the value of $203,996. This was a commercial experiment, and although it is not understood to have resulted in any profit to the exporters, the wool sold at an advance on the American prices current—and would have sold so as to have realized a handsome profit to the exporters, had it been properly sorted and otherwise prepared to meet the requisitions of the English market. Statements of this kind have been published by one of the most prominent of the exporters. It would seem, from Mr. Lawrence's statement, already quoted, that the prices of Australian wools have not yielded a profit over all expenses, during the same years. The quality and style of our wool have been praised by the English press, and are understood to have given high satisfaction to the English manufacturers. On the whole, then, we may regard this experiment as a successful one. The American prices current of those years were about 32 cents per pound. We have seen that the actual cost of wool (including all expenses, and 7 per cent. on price of land and sheep) in the Northern States may be set down at about 27 cents per pound.* These facts show that a *remunerating* price can be obtained for even *Northern* wool in England—if a profit on investment considerably exceeding the highest legal rate of interest (7 per centum) is to be considered "remunerating." And if this is true of the Northern wools of the United States, how much more so would it be of those of the South, the first cost of which has been estimated at less than *one-third* that of the former! †

I see not, therefore, a shadow of a reason why our Southern States might not embark, at once, with perfect safety, in an extensive production of wool, *if they had only the foreign market to look to.* I hesitate not to

* See Letter V. † Ib.

assert that they could drive all the European nations from the market, with the two or three exceptions heretofore specified; and with these, as well as the most favored Austro-Oriental regions, they could maintain a successful competition. The same remark is true of the Austro-Occidental regions of our own continent. And it is difficult to foresee the ultimate extent of this trans-Atlantic demand for wool. Vast portions of the Old World, in those zones where wool must eventually become the principal article of clothing, are but just stepping within the verge of civilization—just laying aside the skins and peltry of the pastoral nomad and the savage hunter, for garments of cloth. In 1771, England imported 1,829,772 lbs. of wool; in 1840, the import was 52,959,221 lbs.! In 1771, the export of woolens was £4,960,240. In 1840, the export of woolens was, £5,652,917, and of woolen and worsted yarn £3,796,644. Making all necessary allowance for the difference in prices, the increase in the export bears no comparison whatever to that in the import. What seems to be the unavoidable conclusion? It is that the *consumption* of a population of 27,000,000 (the population of Great Britain and Ireland) has thus enormously swelled within the period of *sixty-nine* years! This too in a country with a mild climate—which at the beginning of that period (1771) was as far advanced in social and political civilization, and the mass of whose people were as well clothed and better fed, than those of any nation on the Eastern Continent! It is not necessary to follow up this idea. Progress is an inseparable condition of humanity,* and civilization is its fruit. With the latter, new wants—a demand for greater comforts and luxuries—steadily keep pace; and with these again keeps pace the increase of population.† Both the latter causes conspire to swell the demand for cloths; and both causes are at work in this Nineteenth Century, in a velocity of ratio which would fill a Malthus and Ricardo with consternation—if, indeed, it did not convince them of the fallacy of their gloomy theories. I dare to predict that the time will come when the present Russian Empire will consume a greater amount of woolens than the whole Eastern Continent now does! This may not come to pass in a day or a century—but unless retarded by unnatural, not to say *unusual* causes, our posterity in the third or fourth remove will be likely to witness it! Away, then, with those fallacious fears of over-production of cotton, bread-stuffs, etc.—the opposite extreme of Malthusianism—which have disturbed the repose of producers who are not content to let the great natural currents of demand and supply regulate each other; or rather, who are not content with those fair and just profits which they would receive under such an order of things.‡

But the American wool-grower is not compelled to look to the European market, unless he enormously increases his own production—and continues to increase it with the increase of the population. The Census of 1840 shows that the number of sheep in the United States, in 1839, was nearly 20,000,000. These have been steadily increasing, and probably now greatly exceed that number. Yet these have never supplied the demand of *our*

* This may not be thought to accord with preceding statements in relation to the unchangeability of Asiatic character and customs. Particular families or races of mankind have always advanced slowly, but the course of the world, as a whole, is onward. The circle of civilization widens, and races which come in contact with it, receive it, or are conquered and absorbed by the civilized races.

† When I speak of *luxuries* promoting the increase of population, I do not use the word in its invidious sense. I mean by it those things which, though not, strictly speaking, *necessaries*, tend to promote human comfort.

‡ I mean this remark in no ultra spirit. Governments must be supported and resources raised. Incidental protection may be justly afforded to the products of agricultural or mechanical skill, under certain circumstances. But the fewer of these restrictions that are found necessary, the more rapidly, as a general rule, the wealth and comfort of mankind and nations are advanced.

own manufactories alone. The following Table* will show the value of the imports of wool into the U. S. from 1837 to 1847 :

TABLE No. 9.

	Average imports of 1837, 1838 & 1839.	Average imports of 1840, 1841 & 1842.	† Import of 1843.	Import of 1844.	Import of 1845.	Import of 1846.
Wool not costing to exceed 7 cts. a lb	$558,458	$759,646	$190,352	$754,441	$1,553,789	$1,107,305
Exc'ding 7 cts. a lb	801,087	1,004,312	54,695	97,019	136,005	26,921
Total	$1,359,545	$1,763,958	$245,047	$851,460	$1,689,794	$1,134,226

It may be a matter of interest to know from what countries these wools were imported. The following Table‡ will give this information for the last fiscal year, (1846,) and will also give a general idea of our wool trade.

TABLE No. 10.

Whence Imported.	*Wools not exceeding 7 cents per pound.*		*Wools exceeding 7 cents per pound.*	
	Quantity.	Value.	Quantity.	Value.
	Pounds.	*Dollars.*	*Pounds.*	*Pounds.*
Russia	955,163	60,678		
Hanse Towns	6,966	330	13,820	8,433
Holland			170	93
Dutch West Indies	10,774	556		
Belgium	7,177	248	1,407	775
England	1,188,800	35,944	28,406	6,668
Scotland	21,132	1,382		
Gibraltar	207,006	12,339		
Cape of Good Hope	83,662	6,810		
British West Indies	8,694	537	522	70
British American Colonies	168,589	9,543	39,346	4,562
France	84,799	5,424	396	40
Spain	20,730	1,425		
Italy	81,156	4,720		
Trieste (Austria)	111,981	8,151		
Turkey	5,744,328	398,822		
Morocco (Africa)	72,816	4,554		
Mexico	425,148	26,984		
Brazil	45, 215	3,083		
Argentine Republic	4,295,659	327,572	43,831	6,011
Chili	1,819,772	130,837		
Peru	122,686	8,588		
Asia, generally	945,729	58,778	2,397	269
Total	16,427,952	1,107,305	130,295	26,921

That the course of trade indicated by the above Table, will, as has been already intimated, be materially affected by the New Tariff, I think there can be but little doubt. That of several of the places enumerated, too, has been, heretofore, merely a transit one.

To the following letter from the most extensive, and concededly leading American woolen manufacturer, I would call your particular attention. Several of its declarations, placed in italics, by me, are highly significant.

Lowell, Mass., Feb. 10, 1847.

Henry S. Randall, Esq., Cortland Village, N. Y.

My Dear Sir: Your very kind and interesting favor of the 27th ult. duly came to hand and should, if practicable, have received an earlier reply. The business of wool-growing in this country is destined to be of immense importance, and I am firm in the belief that *within twenty-five years we shall produce a greater quantity than any other nation.*

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* Compiled by me from Reports of the Secretary of the Treasury.

† The fiscal year 1842 ended on the 30th of September. Since then, the returns of imports and exports have been made up to the 30th of June. This year, therefore, embraces the imports of nine months only, ending on June 30, 1843; and subsequent years end 30th of June, 1844, 1845, and so on.

‡ Report of the Secretary of the Treasury, 1846.

You ask, "Is the present home demand supplied?" There is not enough annually raised in the country by 10,000,000 lbs. to meet the demand of the manufactories.

You ask, "What countries we can export wool to, &c.?" This country will not export wool regularly for fifteen years, *for the reason that the consumption will increase as rapidly as the production. I can point out articles made of wool now imported, which will require thirty millions of pounds of that of a medium and fine quality, to supply the consumption.* . . . . .

The business of manufacturing wool in this country is on a better basis than ever before, inasmuch as the character, skill and capital engaged in it are such that FOREIGN COMPETITION IS DEFIED. *A very few years and all articles of wool used here will be of home manufacture.*

Now I beg of you to keep the wool-growers steady to the mark. Let them aim to excel in the blood and condition of their flocks, and the day is not distant when they will be amply remunerated. I shall always have great pleasure in hearing from you, and remain

Yours most truly, SAM. LAWRENCE.

Mr. Lawrence has certainly got the annual deficit of home wools low enough. Table 10 shows that it was upward of 16,000,000 lbs. during the last fiscal year, 1846. This, of itself, is something of a *margin* for the South, or some other new domestic producer, to fill!

Hitherto we have simply considered the amount of wool necessary to supply our *manufactories*. But these establishments fall very far short of working up all the wool consumed in the United States, even exclusive of home-made fabrics. The following Table* will show the value of the woolens imported for twenty-five years, up to and including 1845:

TABLE No. 11.

1821.. $7,437,737	1826.. $8,431,974	1831. $12,627,229	1836. $21,080,003	1841. $11,001,939
1822...12,185.904	1827... 8,742,701	1832... 9,992,424	1837... 8,500,292	1842... 8,375,725
1823... 8,268,038	1828... 8,679,505	1833...13.262,509	1838...11,512,920	1843... 2,472,154
1824... 8,386,597	1829... 6,881,489	1834...11,879,328	1839...18,575,945	1844... 9,475,762
1825...11,392,264	1830... 5,776,396	1835...17.834.424	1840... 9,071,184	1845...10,666,176

Here is another and still broader "*margin*" for both the American *Wool-Grower* and the American *Manufacturer* to fill!

With a country well adapted to the production of wool as any the sun shines on—which, all things considered, can produce it *more cheaply* than any extended portion of any trans-Atlantic country—shall we continue to import raw wool?

Whether we should continue to import woolens is sufficiently answered by the last paragraph but one of Mr. Lawrence's letter, fully sustained as the facts therein set forth are by those infallible tests—the *dividends* of our manufacturing establishments. The minimum of these, in *well managed* establishments, has already been stated to be about ten per centum per annum,† and in Mr. Lawrence's own great establishment the dividend of 1846 was *fifteen* per cent. Does any one suppose that the manufacturers of England, with all the advantage they can derive from cheaper labor‡—(but with vastly higher prices for suitable sites and buildings—land taxes, parochial taxes, income taxes—freights and duties on imported wools, etc. etc.)—do or can make dividends touching even the lowest rate above stated? They *cannot.*||

* Report of the Secretary of the Treasury, 1845. † See Letter VII.

‡ Though not directly advised on the point, I take it for granted that the cost of machinery, also, is somewhat less in England.

|| It may be said that the two last-named expenses fall on the consumer. They doubtless would, but the English manufacturer has to compete with those of France and the United States, a much larger proportion of whose stock is of home growth—the latter entirely, in fine fabrics. The abrogation of the Corn-Laws will be of immense advantage to the English manufacturer, and enable him to better compete with other countries. But while the Bank of England ordinarily discounts paper at from 3 to 4 per cent., and while this is the common rate of interest in that country, it could not be expected that manufacturing capital would be allowed to draw 8 or 10, and much less 15 per cent. Such dividends, in a country whose uninvested capital, or that drawing so low a rate of interest, is so superabundant, would at once invite a competition which would speedily bring the profits of manufacturing capital down to a level with those of other commercial capital. We may, therefore conclude that no such dividends are made.

Is it said that our manufacturing companies have often been compelled to suspend, or break up, even under laws as favorable to them as those now in operation? The reason for this is too pointedly and pertinently stated by Mr. Lawrence to require any addition at my hands, in the following extract from a letter to me, bearing date April 13, 1847; and it will be seen in the concluding sentence that the bold and manly declarations of his preceding letter were not the result of a casual or momentary confidence, but are deliberately reässerted:

"The manufacture of wool has often been disastrous to parties who have embarked in it for many reasons, two of which are sufficient—*a want of capital and a want of skill.* These difficulties are being obviated. Capitalists are more ready to embark under certain auspices, and the amount of skill is very fast increasing, so that *this branch is on a footing not to be moved.*"

Undisturbed by those changes of vacillating legislation, or those movements in the National Legislature pointing to such changes—at one time enormously pampering the manufacturing interest, and leading to over-action and rash adventure—at another, threatening it with disaster and utter subversion—our manufacturers will steadily, nay, rapidly advance. If NOW LET ALONE, they will soon not only "*defy foreign competition*" in the home market, but there is not a single good reason to prevent them from *defying* it in the great and opening market of South America, and even *in the Old World.* Some evils or errors in commercial legislation are less to be deprecated than constant changes. The present Tariff, so far as it affects wool and woolens, is the result of a compromise of interests. It may not be perfect in principle or detail. But it does not seem to flagrantly favor or oppress any interest. I speak not in the spirit of a politician, or of the representative of an interest or section, when I express the hope that *no change will be made or attempted in this portion of the Tariff, until the lapse of years shall bring about other changes requiring it, or until ample experience shall clearly call for a revision of the system.*

I have spoken of two "margins" to be filled by the American wool-grower—the *present* deficit in supplying our own manufactories, and secondly, the *prospective* one, as our manufactures increase, so as to overtake and then keep pace with the consumption of an increasing population. The demands of our manufactories will advance *pari passu* with the *production*, Mr. Lawrence predicts, for at least fifteen years. Why not for fifty, or a hundred! Let us glance at the prospective *consumption*, and see if, independent of exportations, it is likely to require any curbs or limits to be placed on *production* or *manufacture.*

In the debates in Congress on the Tariff in 1828–9, Mr. Mallary estimated the consumption of woolens in our country at $72,000,000 per ann.;—$10,000,000 imported; $22,000,000 manufactured; $40,000,000 home-made. The Committee of the "Friends of Domestic Industry," who met in New-York in 1831, reported that the proportion between the amount of wool worked up in factories to that in families was as 3 to 2; that the entire annual product of wool and its manufactures in the U. S. was $40,000,000. These are the only accessible published estimates which now occur to me.

The Census of 1840 shows that the value of woolens made in our manufactories in 1839, was $20,696,999. The import of foreign woolens the same year was $18,575,945, and of raw wool* $1,359,445. It should be remarked, however, that the import of woolens is considerably higher than that of any year before or since. Taking the average of the same three

* Taking the average product of 1837–8–9, as in Table 9. The separate import of 1839 is not before me.

years for which the import of the raw wool is given,* (1837–8–9,) it would reach but $12,863,051. If we suppose the consumption to equal the supply, this would give $33,560,050 as the value of the *factory-made* woolens consumed in the United States in 1839. I confess I have no data other than conjectural ones, to determine the amount of the home-made manufactures for that or any other year; nor do I know that any other person has, or can, have such information. The United States Census, singularly enough does not include this as a separate item. It strikes *me*, however, that Mr. Mallary's estimate is too high, and that of the Report of the "Friends of Domestic Industry" too low. The proportion of home-made to factory woolens is, no doubt, annually decreasing, for reasons already stated;† but as far back as 1839, it would perhaps be a fair estimate to set them down as even. This would give $67,120,100 as the value of the woolens consumed by a population of 17,069,453, or nearly $4 per head. Allowing that every dollar in the manufactured article would represent one pound of stock, or raw wool—and taking slave-cloths, blankets, carpets, coarse home-made fabrics, factory plains, etc., all into account, a dollar is an ample sum to offset against every pound of the raw material—it follows that our whole population annually consume four pounds of wool per head. Judge Beatty of Kentucky, in an estimate published originally in the American Agriculturist, which has been much quoted, sets down the consumption as about 6 lbs. per head. An ordinary Northern farmer or laborer, in comfortable circumstances, will consume about 20 lbs. per annum;‡ the poorer one not far from 15 lbs.; a boy of 8 years old, full 4 lbs.; a girl of that age (in the country, where females are dressed in woolens,) something more than half of that amount. In the cities and villages there is a large class whose consumption for dress ranges from 30 to 40 and even 50 lbs., and, including carpets, much more. A Southern slave consumes from 8 to 10 lbs. Four pounds, therefore, would not seem to be a high estimate, per head, for our whole population.

Let us now take a glance at the increase of population in the United States. The six different Censuses give the following results:

TABLE 12.

1790, Population	3,929,827	1820, Population	9,638,191
1800, --	5,305,941	1830, --	12,866,020
1810, --	7,239,814	1840, --	17,069,453

It will thus be seen that our population increases at a compound ratio of about three per cent. per annum, which would double it—assuming three per cent. to be the precise rate of increase—in 23 years 164 days.

Cheap and abundant provisions—a supply of fertile lands for all who choose to occupy them, &c.—the causes which have conspired to give so rapid an increase, hitherto, still operate to as great an extent as ever, and will continue to, at all events, for half a century, after the Census of 1840. Suppose the rate of increase, then, decreases to two per cent., which would double the population, reckoning as before, once in about 38 years, and

* In Table 9. † Letter VII.

‡ He will wear out, during a year, 1 coat, 4 yards; 1 pair pants, 3 yards; 1 vest, 1 yard; 1 pair flannel drawers, 2 yards; 1 flannel shirt, 2½ yards; 4 pair hose, mittens, &c, 1½ lbs., which, calling a yard a pound of wool, all round, would amount to 14 lbs. His extra or holiday suit, 8 yards, will last 3 years, and his overcoat, 6 yards, 4 years—making the annual consumption of both, 3 1-6 yards. Two flannel shirts, 10 yards, will last two persons say 3 years, making the annual consumption of one, 1 1-9 yards. No account is here made of coverlids, wool hats, carpets, still used by many, and the latter, more or less of it, to be found in the houses of nearly all farmers in "comfortable circumstances." It will be seen that 20 lbs. of wool per head is a moderate estimate. The above enumeration would not equal to exceed two-thirds, and in some cases *half* the clothing annually consumed by the smartly dressing young men who have *labored* on my farm!

that it doubles twice at this rate—and the following would be the result, and the amount of wool required by the population at the periods indicated:

TABLE No. 13.

Year.	Population.	Amount of Wool.	Year.	Population.	Amount of Wool.
1863-4.....	34,138,906	136,555,624	1925.....	136,555,624	546,222,496
1886-7	68,277,812	273.111.248	1963.....	273.111.248	1,092,444,992

Thus in a little over one hundred years, our population is likely to exceed the present one of Europe, (which is 233,500,000,) and we have *now* a sufficient territory to sustain it! At 3 lbs. of wool per head the number of sheep requisite to supply the *home demand* in 1963, would be over 364,000,000!—far more than are now to be found on the whole globe!—Such are some of the *reasonable* expectations which may be formed of the future prospects of the Home wool market.

From the (London) Farmer's Magazine.

NUTRITIVE QUALITIES OF BREAD NOW IN USE.

I HAVE had occasion during the course of many years to pay strict attention to the processes of bread-making, and therefore am prepared to enter upon a subject which the existing state of the country renders of peculiar interest. The title of this article has been adopted in order to embody the leading points of a masterly paper that has lately appeared from the pen of Professor Johnston, of the Edinburgh Society, than whom we do possess an analytic chemist of higher and more trustworthy qualifications. The orders of Queen Victoria in reference to what is styled "second bread," and the laudable zeal with which several noblemen of high rank have adopted similar resolutions, require particular notice, inasmuch as the term "second bread" is of doubtful meaning, and likely to be misunderstood, especially in country districts, where it conveys a definite unfavorable meaning.

The *flour of wheat* is in England of three or four varieties. The first, by way of distinction called "whites," is used in families for the best pastry, or by the bakers to prepare the finest fancy and cottage loaves. The second variety is the "household" flour used in the ordinary baker's household loaf. The third is employed to make seconds bread, which is generally sold at 1d. per loaf of 4 lbs. less than the prime household. There is inferiority of some description in this second flour of the mill; but it does not consist in the retention of the *pollard*, or fine portion of the skin. The country miller, and the families who there bake their own bread upon economical principles, are well advised as to the true meaning of these distinctions. And here, therefore (though the terms of the North may in some slight degree differ from those employed in our agricultural counties), I may appeal to the authority of Professor Johnston, as I practically know that all he says on the subject is strictly correct—thus:

"The grain of wheat consists of two parts, with which the miller is familiar—the inner grain, and the skin that covers it. The inner grain gives the pure wheat flour, the skin when separated forms the bran. The miller cannot entirely peel off the skin from his grain, and thus some of it is unavoidably ground up with his flour. By sifting he separates it more or less completely; his seconds, middlings, &c., owing their color to the proportion of brown bran that has passed through the sieve along with the flour. The 'whole meal,' as it is called, of which the so-named brown household bread is made, consists of the entire grain ground up together, used as it comes from the mill-stones, unsifted, and therefore containing all the bran."

A fourth sort is used in Berkshire, and indeed in all country districts where families purchase or grow their own wheat and send it to the mill: it is called "farmers' grist," or "one-way flour," and contains all the finer portions of the pollard or middlings, after the separation of the *coarse* bran only; this true wheat flour makes the best bread that can be produced—wholesome, nutritious, of a beautiful clear yellowish white, and of surpassing flavor. It is very economical to the family, especially if the dough be made up with water in which the bran has been infused. But as every sack of the best white wheat, weighing 240 lbs., yields somewhere about 40 lbs. of excellent bran, abounding with meal, so much is abstracted from the corn, and barely 200 lbs.—say rather 196 lbs.—remain to the baker. Now we safely infer that the orders of Her Majesty refer to the best farmers' grist, in contradistinction from the extravagant products of the mill, called "whites" and household flour, from which the miller's cloth has removed *all* the pollard. But in times of real scarcity the entire meal claims our attention, excepting in particular cases where coarse bran is found insalubrious to individuals.

Here again we appeal to the philosophical authority of the Professor. "The solid parts of the human body," says Mr. Johnston, "consist principally of three several portions —the fat, the muscle, and the bone. These three substances are liable to constant waste in the living body, and therefore must be constantly renewed from the food we eat." "Again, the fluid parts of the body contain the substances in a liquid form, on their way to or from the several parts of the body in which they are required. They include also a portion of salt or saline matter that is also obtained from the food." "It is self-evident that that food must be most nourishing which supplies all these ingredients of the body most abundantly on the whole, or in proportions most suited to the actual wants of the individual animal to which it is given."

I have stated that a sack of wheat loses in bran 40 lbs. Professor Johnston forms his estimate lower, thus:

"The amount of husk separated by the miller, and which is not sold for human use, varies much; I do not overestimate it when we consider it as forming one-eighth of the whole. On this supposition eight pounds of wheat yield seven of flour, consumed by man, and one of pollard and bran, which are given to animals—chiefly to poultry and pigs. If the whole meal be used, however, 8 lbs. of flour will be obtained, or eight people will be fed by the same weight of grain which only fed seven before.

The calculation, however, is too low; for thirty pounds of coarse bran only, to say nothing of the pollards, is far below the quantity abstracted from a sack of wheat. The greatest economy of product is unquestionably affected by the use of entire flour made from white wheat, and the quality made from that material is excellent. Such bread is obtained at Croydon; it is sweet and pure in flavor, far from brown in color, and is perfectly salubrious; the cost from 1d. to 1½d. below that of the household loaf. Presuming, then, that the flour from a sack of white wheat weighs 236 lbs., inclusive of the bran, then, if one-third be added for the water imbibed and retained in the bread, the yield of every such sack will be more by a fraction than 314 lbs.—a consideration of immense importance during periods of real or even imaginary scarcity, when the prices become distressingly high.

The *assimilative* qualities of wheat now must be considered, and herein Mr. Johnston's analyses and report must be consulted. We have already seen that he classes the solid parts of the human body under three heads —fat, muscle, and bone; and he follows up the subject thus by inductive reasoning:

"What is the composition of pure white flour which contains no bran, and what the composition of *whole meal?* How much of each is also contained in the whole grain?

"1. *The Fat.*—Of this ingredient a thousand pounds of the

Whole grain contain .....28 lbs.
Fine flour .....20 ..
Bran .....60 ..

So that the bran is much richer in fat than the interior part of the grain; and the *whole* grain ground together (whole meal) is richer than the finer part in the proportion of nearly one-half.

"2. *The Muscular Matter.*—Numerous experiments have been made in my laboratory to determine these proportions in the fine flour and the whole seed of several varieties of grain. The particular results in the case of wheat and Indian corn were as follows:

A thousand pounds of the whole grain and of the fine stock contained of muscular matter

Wheat in the whole grain 156 lbs. In fine flour 130 lbs
Indian Corn .....140 .. .. 110 ..

Here, then, is a marked predominance of the ingredient of strength and *power* in favor of the entire flour of either grain.

"3. *Bone Material (phosphate of lime—bone phosphate) and Saline Material.*—Of these mineral constituents, as they may be called, of the animal body, a thousand pounds of bran, whole meal, and fine flour contain respectively

Bran .....700 lbs.
Whole meal.....170 ..
Fine flour..... 60 ..

So that, in regard to this important part of our food necessary to all living animals, but especially to the young who who are growing, and to the mother who is giving milk, the *whole meal is three times more nourishing than the fine flour.*"

If any credence be attached to chemical analyses, and in particular to the experiments of a chemist so thoroughly practical as Professor Johnston, the case of the superior value of whole meal bread is absolutely made out; and it would be found a circumstance of inestimable value to the entire community were there a legislative enactment to the effect *that no bread should be publicly baked* and sold that was not made either from entire flour, or from the farmers' "one-way" grist before described. The latter, indeed, appears to be the quality of the bread by misconception termed "second;" and I can venture to assert that the loaf prepared from flour of a quality so pure and genuine as that obtained from the mill-ground "one-way" would bring thousands of converts to the opinion now so boldly, and with truth, advanced by Mr. Johnston.

As a farther confirmation of this theory, one more Table of calculations is adduced; it is therein stated that "a thousand pounds of the three substances contain of the three several ingredients the proportions of

	Whole Meal.	Fine Flour.
Muscular matter.....	156 lbs.	130 lbs.
Bone material	170 ..	60 ..
Fat.....	28 ..	20 ..
Total in each.....	354 lbs.	210 lbs.

Taking the three ingredients, therefore, together, the whole meal is one-half more valuable for fulfilling all the purposes of nutrition than the fine flour."

I have not as yet noticed the true *brown bread* of the farm; for although a brown mottled tint obtains in the bran or entire meal loaf, yet *that* differs materially from the genuine brown bread, which can be only produced by the farmers' grist, ground from red or dark-skinned wheat, wherein every particle of the coarser pollard is retained by a mill-cloth employed for the express purpose.

I conclude this article by an appeal to the final and conclusive arguments with which Professor Johnston supports his theory, and to its applicability in especial to the far-famed oatmeal of the North.

"The Deity has done far better for us, by the natural mixtures to be found in the whole seed, than we can do for ourselves. The materials, both in form and *proportion*, are adjusted in each seed of wheat in a way more suitable to us than any which with our present knowledge we appear able to devise.

"The oat is more nutritive even than the whole grain of wheat, taking weight for weight. For the growing boy, for the hard working man, and for the portly matron, oatmeal contains the materials of the most hearty nourishment. This it owes in part to its peculiar chemical composition, and in part to its being, as it is used in Scotland, a kind of whole meal."

Many persons object to oatmeal on the ground of its possessing heating properties—referable to the comparative high proportion of its oily material. Let us admit the fact; but in that case I must be permitted to recommend the use of oatmeal most particularly to persons of a spare or meagre habit. At all events they who know what true "round" oatmeal really is, must prefer it to every other variety. I ascribe its superior excellence to the admirable method of kiln-drying, obtained by experience; and as, through the kindness of a friend, I possess a quantity of the meal received direct from Edinburgh, I can honestly recommend it as incomparably superior to anything that is sold as oatmeal by our English corn-dealers. JOHN TOWERS.

PRICES CURRENT.

[*Corrected, August 25, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	5 25	@ 5 37½
Pearls, 1st sort, '46		8 —	@ — —
BEESWAX—American Yellow		— 24	@ — 24½
CANDLES—Mould, Tallow	℔ lb.	— 11	@ — 13
Sperm		— 30	@ — 38
COTTON—From	℔ lb.	— 10½	@ — 14½
COTTON BAGGING—American		— —	@ — —
CORDAGE—American	℔ lb.	— —	@ — —
DOMESTIC GOODS—Shirtings,	℔ y.	— 5	@ — 11
Sheetings		— 6½	@ — 15
FEATHERS—American, live		— 27	@ — 31
FLAX—American		— 7½	@ — 8
FLOUR & MEAL—Genesee,	℔ bbl.	5 75	@ 5 81½
Troy		— —	@ — —
Michigan		5 56½	@ 5 68¾
Ohio, Flat Hoop		5 56½	@ 5 68¾
Ohio, Round Hoop		— —	@ — —
Ohio, via New-Orleans		— —	@ — —
Pennsylvania		— —	@ — —
Brandywine		— —	@ — —
Georgetown		— —	@ 6 25
Baltimore City Mills		— —	@ — —
Richmond City Mills		— —	@ — —
Richmond Country		— —	@ — —
Alexandria, Petersburg, &c.		— —	@ — —
Rye Flour		4 —	@ 4 25
Corn Meal, Western and State		2 50	@ 3 —
Corn Meal, Jersey and Brandywine		3 50	@ 3 75
GRAIN—Wheat, White	℔ bush.	1 25	@ 1 35
Wheat, Red and mixed		1 —	@ 1 20
Rye, Northern, new and old		— 90	@ — 93
Corn, Jersey and Northern yel		— —	@ — 78
Corn, Southern, yellow		— 72	@ — 74
Corn, Western, yellow		— 73	@ — 75
Oats, River and Canal		— 60	@ — —
Oats, Jersey		— —	@ — —
HAY—North River in bales,	℔ 100 lb	— —	@ — 50
HEMP—American, dew-rotted	ton	140	@ 150 —
" " water-rotted		175	@ 200 —
HOPS—1st sort 1846		— 10	@ — 15
IRON—American Pig, No. 1		30 —	@ 35 —
" Common		27 50	@ 30 —
LIME—Thomaston	℔ bbl.	— 87½	@ — 90
LUMBER—Boards, N.R.	℔ M. ft. clr.	35 —	@ 40 —
Boards, Eastern Pine		— —	@ — —
Boards, Albany Pine	℔ pce.	— 12	@ — 21
Plank, Georgia Y. Pine.	℔ M. ft.	27 50	@ — —
Staves, White Oak, pipe,	℔ M.	50 —	@ — —
Staves, White Oak, hhd		40 —	@ — —
Staves, White Oak, bbl		30 —	@ — —
Staves, Red Oak, hhd		24 —	@ 28 —
Hoops		20 —	@ 30 —
Scantling, Eastern		16 25	@ 22 50
Scantling, Oak		30 —	@ 35 —
Timber, Oak	℔ cubic foot	— 25	@ — 30
Timber, White Pine		— 18	@ — 25
Timber, Georgia Yellow Pine		— 28	@ — 32
Shingles	℔ bunch	1 75	@ 2 25
Shingles, Cedar, 3 feet, 1st quality		26 —	@ 30 —
Shingles, Cedar, 3 feet, 2d quality		24 —	@ 28 —
Shingles, Cedar, 2 feet, 1st quality		18 —	@ 22 —
Shingles, Cedar, 2 feet, 2d quality		16 —	@ 20 —
Shingles, Cypress, 2 feet		15 —	@ 18 —
Shingles, Company		35 —	@ 38 —
MUSTARD—American		— —	@ — —
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@ — 14
Cut 4d to 40d		— 4¼	@ — 4½
PLASTER PARIS—	℔ ton	2 50	@ 2 75
PROVISIONS—Beef, Mess,	℔ bbl.	12 50	@ 13 25
Beef, Prime,		8 50	@ 9 —
Pork, Mess, Ohio, new		15 12½	@ 15 25
Pork, Prime, Ohio, new		12 12½	@ 12 25
Lard, Ohio	℔ lb.	— 10	@ — 11½
Hams, Pickled		— 7	@ — 7½
Shoulders, Pickled		— 6	@ — 6½
Sides, Pickled		— —	@ — —
Beef, Smoked	℔ lb.	— 10½	@ — —
Butter, Orange County Dairy		— 19	@ — 20
Butter, Western Dairy		— 14	@ — 16
Butter, Grease		— —	@ — —
Cheese, in casks and boxes		— 7	@ — 8
SEEDS—Clover	℔ lb.	— 7	@ — 7½
Timothy	℔ tierce	16 —	@ 20 —
Flax, Rough		— —	@ — —
SOAP—N. York, Brown	℔ lb.	— 4	@ — 5½
TALLOW—American Rendered		— 9½	@ — 9½
TOBACCO—Virginia	@ lb.	— 3	@ — 7½
North Carolina		— —	@ — —
Kentucky and Missouri		— 3	@ — 7½
WOOL—Am. Saxony, Fleece,	℔ lb.	— 40	@ — 45
American Full Blood Merino		— 35	@ — 38
American ½ and ¾ Merino		— 30	@ — 34
American Native and ¼ Merino		— 26	@ — 28
Superfine, Pulled Country		— 32	@ — 34

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REMARKS ON THINGS IN GENERAL.....No. III.

BY A RAMBLER IN THE MOUNTAINS OF VIRGINIA,

With Notes by the Editor of The Farmers' Library, to whom they were addressed.

WARM SPRINGS, Bath Co., July 18, 1847.

You need not be told that this is only one, however distinguished, out of a great variety of medicinal springs that find their way to the surface of the earth among these mountains of Western Virginia, passing in their way, as we must suppose, close by fiery furnaces and through filters of salt—for here are, besides, within a day or two's ride of each other, the *Hot*, the *Sweet*, the *Red Sweet*, the *White* Sulphur and the *Red* Sulphur, and the *Salt* Sulphur and the *Blue* Sulphur Springs, claiming to be specifics for phthisis laryngitis, bronchitis—for dyspepsia and diarrhea—for diseases of the liver, the heart, the bladder and the kidneys, and for all the other diseases and ills that flesh is heir to. Welling up to the light half way between the great marts and thoroughfares of life and business in the East and the West, it would seem as if they were intended to draw together, in the season of most leisure, from all its extremes, brethren of a common country for social and political communion; and doubtless their political uses in this way would be equal to their sanatary effects, were it possible to reach them as easily as railroads and steamboats take us in vast swarms to other places of summer resort. In the place of hundreds there would be thousands at all these mountain springs; and yet it may be questioned whether, to the valetudinarian of the cities, the long ride and jolting over the mountains is not more than half the battle. When the late celebrated Dr. Brown, of Baltimore, was consulted as to the particular waters best suited to his patients, he usually inquired the *distances* respectively, and always recommended the most *distant place!* For those who would have something better than a mere hasty newspaper notice, I would recommend Mr. Burke's "Mineral Springs of Virginia." From recent personal experience I can speak yet only of the WARM SPRINGS—now, and for a few years past, under the immediate control of the proprietor, Doctor John Brockenburgh, former President of the Bank of Virginia.

The Bath is of a circular form, forty feet in diameter and between five and six feet deep, and so perfectly transparent that a man of Christian temper with half an eye might read the words "HONOR THE PLOW IN PREFERENCE TO THE SWORD" in 'small caps,' at the bottom of it. The depth, however, may be regulated at pleasure, and very quickly, for as the water comes bubbling up from the bottom, and breaking in globules resembling quicksilver on its surface, the whole volume of it passes off and is every moment renewed, at the rate of some thousand gallons a minute.

Truly has it been said by Col. Perkins, that all who have described this noble fountain write with enthusiasm; nor is it indeed to be wondered at, for the

world, as he says, "may be well challenged for its equal." Its temperature, buoyancy, refractive power, transparency—all invest it with indescribable luxury to the feelings and the sight; and no less truly has it been added by Mr. Burke that the effect on the human frame is dazzling; could Damon have caught a glance at his Musidora in *such a bath*, it were indeed a trial of Love's respectful modesty to withdraw his gaze!

> "Then to the flood she rushed; the parted flood
> Its lovely guest with closing waves received,
> And every beauty softening, every grace
> Flushing anew, a mellow lustre shed,
> As shines the lily through the crystal mild,
> Or as the rose amid the morning dew
> Fresh from Aurora's hand more sweetly glows"

The water of this celebrated spring is of the average temperature of 98°—the same in winter as in summer. It and the gas which is constantly escaping from it, have been carefully analyzed by Prof. Rogers, and from this account, says Mr. Burke, they appear to contain neutral salts and various gases, which act as a gentle aperient, diuretic and diaphoretic. The large proportion of Epsom salts, he says, doubtless gives the water its aperient quality, while the carbonic acid it is found to contain, and sulphuretted hydrogen, give tone and energy to the stomach.

The bath itself is so captivating and voluptuous that it becomes necessary to warn those who enjoy it for the first time against too long indulgence. Mr. Jefferson is said to have done himself serious injury in that way, but he would plunge and remain in it nearly an hour at a time, three times a day. An account of this bath appeared some time since in the Southern Literary Messenger, with the simple averment, as to the accommodations and comforts, that they were "fully equal to those of any watering-place in Virginia." The writer might have fearlessly said, if they were as good and as ample then as now, that they were equal to any in the United States. How, indeed, could it be otherwise?—owned and managed as this establishment now is, under the personal supervision of one of the very best bred and most traveled gentlemen of the Old Dominion in her palmiest days—with his own cooks and servants, brought up from Richmond, where his house, ever the seat of the most refined and liberal hospitality, will long be remembered by those whose learning, refinement and patriotism gave them claims to its enjoyment. The roads through all these mountains have been well graded, and made as good and safe as mountain roads can be. The Warm Springs Mountain, through a gap of which you come in sight of this establishment at the distance of a mile, as you approach it to breakfast, is one of the most lofty in the range to which it belongs, being nearly 3,000 feet above tide-water. All along the ridge of it immense rocks break through the green covering, in naked and irregular projections, like so many enormous vertebræ. Climbing to the top of the middle and highest one of these, you get a prospect of vast extent on all sides, reaching eastward even to the "Blue Ridge." And here, on the face of this eternal rock, braving lightning and rain, tempest and sunshine, instead of a host of obscure names, inscribed usually in such places as so many vain memorials of egotism and vanity, you find only the letters 'H. Clay,' deeply engraved by one of his many votaries. Appropriate tablet for such a name!—at once elevated and enduring! After all, he but shares the common lot of men possessed of great intellectual power, animated by a fervid, uncompromising temperament. If they raise up many implacable enemies, they surround themselves also with a host of ardent friends, bound to them by their high qualities as with "hooks of steel."

But I must not forget to tell you how, and how soon, you can be put down in the midst of these mountain springs, should you be disposed to come. You leave Baltimore any day—we will say Thursday morning at half past seven—dine at Harper's Ferry, and reach Winchester by the Railroad, in time to depart that afternoon in the stage; you breakfast on Friday morning at Harrisburg, and reach Stanton by an excellent Macadamized turnpike, on Friday to dinner; sup and lodge quietly that night at Cloverdale, and on Saturday morning breakfast here at the Warm Springs, and before night arrive at the celebrated old "White Sulphur"—where, as I learn, my old friend Caldwell still flourishes, as it were in "perpetual youth." May he still so live another "three score and ten," with

Hygeia for his handmaid, to receive the pilgrims that must ever gather from all quarters around his health-restoring fountain, himself a living and cheerful witness of its virtues. It is reported there are two hundred and twenty there now, but double that number would not incommode him. Farish & Ficklin, old contractors at Charlottesville, have again covered these and other principal mail-routes with their excellent stages, and teams, and drivers, and their names are a sufficient guaranty that all in that department is 'O. K.'

In the field, as well as at the *table d'hôte*, two senses have convinced me that no country can be better adapted for the growth and perfection of mutton than is this, for finer I never saw or tasted.

In the hope of having time on my return for a more leisurely agricultural survey, let it only be noted here that I have met with a grass which is altogether new to me, and promises to spread and be of great value. When I say new, I might probably say that I saw the same grass growing luxuriantly in Dr. Thornton's meadows at Montpelier. It seems to be identical with the greensward, except that it is more gigantic. The blades of the second growth are very silky; and I understand that both horse and ox, for whose judgment I entertain profound deference, delight to graze on it. In rich, clayey, low ground, it is very luxuriant, and is overcoming the timothy. How or when it came here no one can tell me. Doctor B. informs me that it has increased wonderfully during the few years he has been here, although it has been annually mowed and grazed on. It ripens rather earlier than timothy, or about the time the red-clover blossom becomes brown. I learn that it abounds on the low lands of the South Branch of the Potomac, and is deemed very valuable for grazing, and Dr. B. is of opinion that if mowed in time it would yield in his meadow from 1½ to 2 tons of the best sort of hay. From all I can learn of its character, particularly as a superior mowing-grass, it is probable that measures will be taken to distribute it widely. Whatever more may be learned of it worthy of note, in my progress westward, you shall know. If good luck should throw Dr. Bachman in my way, I should hope to gather something, in regard to this and other grasses, worthy of your Journal. By the way, they find the Volunteer Red Clover a great pest in their timothy meadows hereabout, as the stalk becomes exceedingly hard before the timothy is sufficiently matured to make the best hay. You are aware that while clover makes the better hay for being cut earlier, timothy should stand to go well to seed.—I hope to gain, farther westward, better information, too, as to the system of breeding and rearing their stock cattle.

Mem.—There are few things to which these valleys are more congenial than the *Hop;* in fact, *Vines* of every kind seem to glory in the climate, and greatly beautify the country as you pass through it.

White Sulphur Springs, Greenbriar County, Va., July 28, 1847.

If, before you die, you wish to see "the man with the cue," you may find him here, at the good old *White Sulphur*, in the person of the worthy Proprietor. He really looks not five years older than he did some twenty-five years ago; his politics as sound, his friendships as stanch, and his laugh as loud and honest as ever! It would do his Baltimore friends good to see how manfully the old gentleman maintains his ground, single-handed, against the fell Destroyer with his inexorable long scythe, before which all things perishable must fall at last.

Louisiana, Virginia, Missouri, Maryland, North Carolina, Georgia, Tennessee, New-York, Mississippi, Ohio, South Carolina, Kentucky, Alabama, Pennsylvania, Massachusetts, Rhode Island, New-Hampshire, Texas and Cuba all have their representatives here now in convention. Not a political convention, mind ye! Not at all. Ours here is a convention of gentlemen of all parties, met to drink at the pure fountain of health, to indulge in the pleasures of social intercourse, to interchange knowledge, and to recreate in the mountain air, and thus regain and accumulate what vigor we may for the several duties that await us, each in his sphere, in the busier seasons approaching.

Those who have not been for some years at the several watering-places in these mountains—which, when once you are here, seem to shut you out from the great world of toil and care—can have no idea of the improvements that have been made in the mean time.

Familiar as many of your city readers may be with the arrrangements and

economy of most of these great places of summer resort, where some come to get rid of *ennui*—some to empty and some to replenish their purses—some to preserve and some to regain their health—you may yet have a thousand readers in the country, toiling on their farms, to whom even the most imperfect sketch of this one, among the most celebrated watering-places in the world, may not be unacceptable.

—The White Sulphur Spring itself, then, they may be told, is "situated in an elevated and beautifully picturesque valley, hemmed in by mountains on every side, and is in the midst of the celebrated 'spring region.' Its elevation above tide-water is two thousand feet. It bursts with unusual boldness from rock-lined apertures, and is inclosed by marble casements five feet square and three and a half feet deep. Its temperature is 62° Fahrenheit, and remains uniformly the same, winter and summer. The principal spring yields about eighteen gallons per minute, and is never increased or diminished by any changes of weather. The water is perfectly clear and transparent, and deposits copiously, as it flows over a rough and uneven surface of rocks, a *white*, and sometimes, under peculiar circumstances, a *red* and black precipitate, composed in part of its saline ingredients. Its *taste* and *smell*, fresh at the spring, are that of all waters strongly impregnated with sulphuretted hydrogen gas."

The fountain is inclosed and covered by a circular edifice, about thirty feet in diameter, and supported by pillars, like the cupola of a church or other public building, except that in place of a weathercock, or some religious emblem, the summit is embellished with a large marble figure of Hygeia, the goddess of health, presented by the late Mr. Henderson of New-Orleans, in a spirit of gratitude for the benefit he had received at this noble fountain. Here, then, come the visitors, early in the morning, to gulp down from two to six glasses of water, impregnated chiefly with the sulphates of lime, of magnesia, and of soda.

On this occasion, the ladies—God bless them!—turn out in thick-soled shoes, shawls and bonnets, and seem by no means ambitious of being noticed; while the coarser specimens of the human form divine come enveloped in full winter costume.

Within two hundred yards of the spring, in the center of the valley—which here spreads out nearly to a plane surface—and at the lower end of a lawn of some eight or ten acres, stands the *Dining Hall*, nearly two hundred feet long, with its tables to accommodate, and servants to give the needful attention to, some six hundred guests on occasion.

For lodging and private comfort here the arrangements are altogether different from those you meet at Northern watering-places. There the guests of each establishment—sometimes from one to six hundred—eat and sleep all under one roof; while here, at one *coup d'œil*, you see from one hundred and fifty to two hundred cabins and cottages strung along, at a considerable elevation above the spring, in curvilinear form, adapted to the sinuosities of the mountain-base that skirts the valley, and other irregularities of the site; but still making nearly an oblong square, and occupying a line, I should think, of nearly a mile in its entire length, inclosing an area of some ten or twelve acres, well set in blue-grass, intersected with dry walks for exercise, and ornamented with that *variety* of trees which seems characteristic of this region. Here the native Oak, in all its grandeur; there the symmetrical Sugar Maple; next again the Hickory; and hard by the Locust, of rapid growth itself and congenial to the growth of all about it.

These beautiful forest trees have been so judiciously left and pruned as not to conceal and smother what they were intended to shade and beautify; and make, with the cottages, especially when these are lighted up at night, altogether, a fine panorama, that really seems like the work of magic as compared with my remembrance of its original rude condition.

Distinguished foreigners, Lord Morpeth among them, in their admiration, have pronounced the bath at the Warm Springs and the White Sulphur, for arrangements and extent of accommodation, scenery, and health-giving qualities of the water, far superior to any similar resorts in Europr.

By the word *cabins* you are not to understand rude log huts—not at all! These are all of brick, or neatly framed, finished and painted, with a nice piazza separately railed in for each; and many of them, especially the "Baltimore Row," displaying handsome and chaste specimens of architecture. This row belongs,

the *usu fruct*, to Baltimore townsmen, Messrs. Ridgely, Hoffman, Barney, Latrobe, Bonaparte, P. Thomas, Patterson and Glenn. On a site yet more elevated, overlooking the whole square, stand the still more considerable and costly establishments of two wealthy Carolinians, Singleton and Hampton. Any one of them is good enough, I should think, "for a prince," as must be anything that is good enough for a *Hampton*.

When the dinner-bell sounds here, it is amusing to see how simultaneously all these cabins are emptied of their tenants, and how even all the dear ladies come flocking to be fed, like pigeons called down from the dove-cot. Well, Sir, after all, what would this world be worth but for them? for 't is *they* that "give to life its lustre and perfume, and we are weeds without them."

Several Baltimoreans are here with and some without their families; among the former I see the distinguished Senator Johnson. Judge Cabell is here too, on his way to the Supreme Court. Here, too, is the venerable Judge Brooke, eighty-four years old, of the good old Revolutionary army breed—straight as an Indian—keeping well-up in his costume with the modern cut, except that he would "go his death" upon the *white cravat!*—emblem of the old school to which he belongs; in deportment and manners being courteous and communicative, without giving or taking unseemly liberties. Here, too, is Governor Coles, full of intelligence and interesting reminiscences of the times of Madison and Monroe, those palmy days of the Republic—together with his amiable family; and Dr. Mercer, a quiet, unostentatious, exceedingly well-informed and affable millionaire planter of Mississippi—resident of New-Orleans in winter, where and with whom Mr. Clay has spent his last two. *Mem.*—What think you of a plantation with four or five hundred cattle, eight hundred swine, and yet not making more than half its supply of provisions?

I must not close this rude sketch without a word about the *roads and the conveyances*. You leave Baltimore at 7½ A. M. on the railroad, reach Winchester that evening, and take Farish & Ficklin's superior line of post-coaches by a Macadamized turnpike one hundred miles up the Valley of Staunton, supping and lodging next night comfortably at Cloverdale. The second morning you breakfast at the "*Warm Springs*" on "*mountain mutton*"-chops, venison steaks, and bread in all possible and excellent varieties—French-rolls, biscuit, waffles, flannel-cakes, muffins and Indian-corn bread, in the cook only knows how many forms, from egg-pone and batter-cakes to griddle-cakes and "scratch-backs!" Don't forget, if you have never seen it, to run and look and wonder at the *warm bath*, 98° Fahrenheit, forty feet diameter and six feet deep, if so deep you like to have it, and withal as clear as crystal and sparkling as Champagne! But mind, if once you plunge into it, there is no knowing when you will get away. Mr. Jefferson came near dreaming his life away in it, so delicious did he find it. Folks usually postpone, until they return from the other Springs, to linger there for weeks, until Jack Frost comes along in earnest to dispel the fogs and fevers of the low grounds." I enjoyed it for ten days *en passant*. If you are stiff in your joints, or drawn up with *rheumatiz*, you can stop and get limbered, and straightened out and set up, at Dr. Goode's *Hot* Spring, temperature 108°! Surely it must come from somewhere very near to Old Nick's furnace!

White Sulphur, Greenbriar County, August 4, 1847.

Turning back for a general review of the habits and husbandry of the region through which I have passed, from Fredericksburg to Lewisburg, the county town of Greenbriar; and having regard to its climate and capabilities, I should say that as Nature forms it, it offers ample reward for skillful industry and every resource for social enjoyment. Its inhabitants are urbane, hospitable and upright: but, though far from being deficient in knowledge of the general progress of agricultural improvement, in its implements and modes, it must yet in truth be said that not many appear to be sufficiently impressed with the importance of *studying the principles* of that most important of all the arts on which the mind and labors of civilized man can be employed.* In truth they

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[* Yet it is, confessedly, by a better understanding of these principles—by the increasing knowledge of the *why and the wherefore* as to the nature of the soils, the constituents of

appear not yet, on the eastern side of Thornton's Gap especially, to have awakened to the revolution in the commercial circumstances of their position, which has been effected by the extended application of steam and the construction of works of internal improvement—works which have raised up competitors in their old branches of husbandry, against whom it is obviously impolitic if not impossible for them to contend. How is it possible to follow *grain*-growing successfully, and as a principal business, at such a distance from all available markets, and at such cost of transportation, on land that does not average more than seven bushels of wheat and twenty of Indian corn to the acre? and especially where there is resident in the soil neither lime nor plaster, and yet more, where not one farmer in one hundred pursues systematically any means of supplying the want of mineral and artificial fertilizers, by collecting materials to augment, and by saving every particle of, his *stable and barn-yard manures*. To the more economical farmers in other parts of the country, a plain statement of the universal waste of these materials in the South would be as incredible as it is injurious and disparaging to those who commit it. A farmer of the highest order of intelligence, in Rappahannock County, on a beautiful estate of a thousand acres, with sixty or eighty head of cattle and horses, besides hogs and sheep, himself observed that he made hardly manure enough *for his garden!* while his hundred acres of wheat, very near his homestead and stables, was not expected to yield more than seven or eight bushels to the acre, and that on land with a due portion of clay, and otherwise well adapted to grain as well as grass. It would not, however, be fair even to allude to this case, were it not believed to be a fair specimen of general improvidence as to the accumulation and use of home-made manure. I must, therefore, be permitted to declare that in all my route, as far into Western Virginia as the Seat of Government of Greenbriar County, and anxious to find the contrary, I have not yet seen an instance of proper, systematic, farmer-like solicitude and attention on the score of home-made manure. The greatest progress in improvement, and the best management on a considerable scale, as far as I had an imperfect opportunity to judge, is at the Warm Springs. But if on this point the neighboring farmers were, as they ought to be, as watchful as a hawk for a partridge, you would not see at the hotels, all along the road from Newmarket to Lewisburg, large piles of manure, the daily cleansing of the stables, thrown out and

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plants, and the action of mineral, animal, vegetable and atmospheric agencies—that in England the average *increase* in the wheat crop per acre has been brought from 17 up to 26 bushels, since 1821, or an *increase* nearly equal to the average *aggregate* produce of the United States.

We are aware that General Washington instituted extensive inquiries to ascertain the probable average product of the United States, and that these inquiries led to the impression that it might be put down at about 17 bushels; but we are well convinced that either there has been a great reduction in the acreable product of the whole country since, or that some delusive information led to an overestimate at that time. We have lately had occasion to show that the average in Ohio does not go above 20 bushels, and we much doubt if it exceeds 17. Official returns show the average in New-York in 1845 to be under 14; and it may well be questioned whether in Maryland, which gave 3,345,783 bushels in 1839, the average exceeded 8; or whether in Virginia, which gave 10,109,716, it came up to 10. At the rate of 8 bushels for Maryland, it would require about 418,222 acres to produce 3,345,783 bushels. Now her whole surface, exclusive of water, is put down by Darby at 7,040,000 acres—and according to this calculation it would require only every sixteenth acre to be in Wheat to produce the number of bushels stated above, at 8 bushels to the acre; that is, suppose the whole State to be divided into farms of 322 acres, and allowing 8 bushels to the acre it would require only 16 acres to each of those farms to give the 3,345,783 bushels. Allowing 12 bushels to the acre as an average of the U. S., it would require but about 7,000,000 of acres to be in Wheat to produce the 84,823,272 bushels, the whole produce of the Union in 1839; and we venture the belief that the average does not exceed 12 bushels. Finally, we have no doubt that the course recommended by Mr. Minor would, in ten years, go near to double the Wheat crop of the State, adding $10,000,000 to its income. *Ed. Farm. Lib.*]

exposed to all weathers, from day to day, and so deposited, when it can be done, on hill-sides and precipices, as if it were the express intention that the bounteous rains of heaven, designed to fertilize and replenish the earth, should here be impiously availed of to extract and wash away what every good farmer as fondly regards as the miser does his gold. In view of such improvidence, I could almost find it in my heart to respond approvingly to the sentiment expressed lately at a Farmers' Club, that willingly to let a pint of manure run off from a farm, ought by law to be made a punishable offence against the Commonwealth.

How widely different, Sir, is such management from that described in your Journal where you detail an account of a visit to Mr. HALL, near Lebanon in New-York. From his farm, consisting of only 200 acres—20 in wood and 180 arable, 50 each year under the plow and the residue in grass—he, it seems, sells 4,000 pounds of butter and 15,000 pounds of pork, his hogs averaging 290 pounds. But he makes, be it noted, 150 *cords* of rich manure from his hogs, and 200 from his "teams and cows." His force, besides being a "whole team" in himself, is but two men through the year, and one for eight months—his usual number of cows at the pail being 22. But lest the reader may suppose that instances drawn from the North are altogether inapplicable to the South, let me avail myself of the reasoning of a native-born son of the Old Dominion, as precisely applicable to all those in that State who think it not essential to make manure; for it would really seem to be impossible that those in the region to which I am referring who persist in wearing out their lands by crops of grain without the application of stable manure, and barn-yard manure, and intervening grass crops, can have read a chain of reasoning, as conclusive as mathematical demonstration, contained in an Address—one of the ablest in the agricultural annals of any country—delivered by FRANKLIN MINOR, Esq., before the Agricultural Society of Albemarle, 1st of November, 1846. Sure am I that all your readers will thank me for suspending my own crude suggestions, while I extract from that admirable performance what is so exactly apposite to the subject in hand. I am not sure that Mr. Minor embraces in his estimate the cost of transportation of the grain to market, though it is presumed he rates the corn and wheat at its actual money value to the farmer, whether at home or abroad. It will be observed, however, that he puts down the average of wheat at 8, and of corn at 25 bushels to the acre—which may be fair as for the general run of unimproved land in Albemarle, but is undoubtedly one bushel too much wheat and five too much of corn for Fauquier, Culpeper and Rappahannock, and about two or three only below the average of wheat in the Valley of Shenandoah, and about right as to their produce in corn. I crave for the following extract from Mr. Minor's Address the earnest attention of every reader of your journal; or if the father who does not like to have his eyes opened to a view of his ruinous old system (preferring to remain in ignorance of the catastrophe to which it is leading him,) will not read it himself, let him have at least the kindness to hand it to those who are being reared under his care, and whom he would like to see embark in their profession with something like an estimate of what it demands of thought and forecast, as an intellectual and profitable occupation. He who would not believe in reasoning like that embraced in this extract, would not believe St. Paul himself, though he were to rise from the dead.

"But even in the absence of all experience, both foreign and domestic, on this subject, is not the profit of improving land susceptible of conclusive demonstration by calculation—by figures which, you know, cannot lie? I shall endeavor to show that it is from the following data, which I believe to be as nearly correct as the nature of the case admits of:

"1. That by bestowing greater attention and more labor on the accumulation of the materials for making manure, and by having better fixtures for saving it and preventing its waste, we can increase the quantity of manure we annually make at an expense which will not exceed *one dollar* for every additional wagon-load so made and delivered on the land.

"2. That land which will bring *five* barrels of corn per acre without any manure, will bring *eight* if manured at the rate of twenty wagon-loads to the acre; that the same land will bring *eight* bushels of wheat after the corn without the manure, and *fifteen* after the corn with manure; and that if seeded with clover after the manure and plastered, it will yield *one and a half* tons of hay to the acre.

"3d. That such land cultivated without manure for twelve years in corn and wheat alternately, and having all the offal of the crops restored to it, may perhaps retain its fertility but cannot improve; and that the same land manured once at the rate before mentioned, and

cultivated in corn, then wheat, and two years in clover, and the same rotation pursued for twelve years, and having also all the offal of the crops restored to it, will continue to yield the increased crops, and will moreover improve in value fifty per cent. supposing the first cost to be ten dollars per acre.

"4. That it costs *six dollars and fifty cents* to cultivate an acre of land in corn and save and house the crop after the mode usual in this country; *three dollars and fifty cents* to seed after corn, harvest, secure and thresh the produce of an acre of land in wheat if it yield eight bushels, and fifty cents more if it yield fifteen bushels; and *two dollars* to mow, cure and stack an acre of hay yielding one and a half tons.

"5. That clover-seed can be bought or raised for *six dollars* a bushel; and ground plaster bought for eight dollars per ton.

"6. That the average price of corn may be taken to be two dollars and a half a barrel, or *fifty cents* per bushel; of wheat *ninety cents* per bushel, and of clover-hay *fifty cents* per hundred weight.

"From these data I have prepared the two following Tables—the first of which exhibits the annual gross product of an acre of land cultivated alternately in corn and wheat for twelve years, the expense of making and saving the crops, and the clear profits per annum; the second showing the gross annual product of the same acre manured the first year with twenty wagon-loads of manure, and cultivated in corn, then wheat, and two years in clover, and the same rotation carried out for twelve years; also the expenses of manure, plaster and clover-seed, the cost of tillage, harvesting, &c., and the clear profit or loss per annum. All the offal of the crops supposed to be returned to the land in each case:

TABLE I.

Year.	Kind of crops.	Yield in bushels.	Value of crops.	Expenses of tillage, harvesting, &c.	Clear profit.
			$ cts	$ cts	$ cts
1	Corn.....	25	12 50	6 50	6 00
2	Wheat ..	8	7 20	3 50	3 70
3	Corn.....	25	12 50	6 50	6 00
4	Wheat ..	8	7 20	3 50	3 70
5	Corn.....	25	12 50	6 50	6 00
6	Wheat ..	8	7 20	3 50	3 70
7	Corn.....	25	12 50	6 50	6 00
8	Wheat ..	8	7 20	3 50	3 70
9	Corn.....	25	12 50	6 50	6 00
10	Wheat ..	8	7 20	3 50	3 70
11	Corn.....	25	12 50	6 50	6 00
12	Wheat ..	8	7 20	3 50	3 70
			118 20	60 00	58 20

TABLE II.

Year.	Kind of crops.	Yield in bushels and tons.	Value of crops.	Expenses of tillage, harvesting, &c.	Expenses of manures, clover-seed & plaster	Clear profit.	Loss.
			$ cts	$ cts	$ cts	$ cts	$ cts
1	Corn.....	40 b	20 00	6 50	20 00		6 50
2	Wheat ..	15 b	13 50	4 00		9 50	
3	Clover ...	1½ t	16 50	2 00	1 50	13 00	
4	Clover ...	1½ t	16 50	2 00	50	14 00	
5	Corn.....	40 b	20 00	6 50		13 50	
6	Wheat ..	15 b	13 50	4 00		9 50	
7	Clover ...	1½ t	16 50	2 00	1 50	13 00	
8	Clover ...	1½ t	16 50	2 00	50	14 00	
9	Corn.....	40 b	20 00	6 50		13 50	
10	Wheat ..	15 b	13 50	4 00		9 50	
11	Clover ...	1½ t	16 50	2 00	1 50	13 00	
12	Clover ...	1½ t	16 50	2 00	50	14 00	
			199 50	43 50	26 00	136 50	6 50

"The first Table shows the total profits of an acre of land cultivated without manure and grass, to be $53 20 for twelve years, or an average annual profit of $4 35.

"The profits of the same acre, cultivated under a different system with manure, clover and plaster, are, according to the second Table, $136 50, from which we must deduct $6 50, the loss sustained the first year, leaving the net profits $130, clear of all expenses; to which add the increased value of the land at the rate of fifty per cent. for the twelve years, and we have $135 for the total net profits for twelve years, or $11 25 per annum—showing an annual difference of $6 40 an acre, equal in this case to about two hundred and thirty per cent. per annum in favor of improvement by manure, clover and pasture. This would seem to settle the question of profit.

"The calculation is made most favorably to the unmanured land in every respect. In the first place it is supposed that it would not deteriorate under the alternate cultivation in corn and wheat, when it is more than probable that it would be exhausted, yield diminished crops, and decline in value. To prevent this, it might be necessary to rest it every third year. This would diminish the number of corn and wheat crops to *four* each, instead of six as in the Table, and make a difference in the total net profits for the twelve years, of $19 40. On the other hand, no allowance is made in the second Table for the clover-seed which might be saved each year after cutting the hay; this might be safely put down at half a bushel per acre, or three bushels in the twelve years, which, at six dollars a bushel, would give $18 to be added to the total profits of the manured land. If we make these allowances, the total profits of the two acres for twelve years will stand thus:

Of the unmanured land	$38 80
Of the manured land	153 00
Making the difference of total profits for twelve years	$114 20

or $9 50 per annum, almost the prime cost of the land.

"If we extend the calculation to *ten* acres instead of *one*, the results will be in the same proportion, and we shall have the total profits of ten acres unmanured, and allowance made as above for one year's rest in three, $388 in twelve years, or $32 33 per annum; and of the same ten acres manured, and allowance for clover-seed as above, $1,530 in twelve years, or $127 50 per annum, making the total difference for twelve years $1,142. So that every farmer who makes two hundred loads of manure more than his usual quantity, and applies it to ten acres of land such as that described, and pursues the system designated in the Table, with a liberal use of clover-seed and plaster, may calculate on adding $1,142 to the clear profits of his farm every twelve years; while he who from carelessness and laziness loses the opportunity of making that additional quantity of manure, loses also the chance of realizing an equal sum in the same time.

"If we attribute all the difference to the manure, clover and plaster, (and no other cause of the increased profits is supposed,) then we have the expenditure of $26, (the cost of the manure, &c.,) yielding in twelve years $114 20, or about thirty-six per centum per annum. In other words, the Table shows that money and labor expended in the making, saving and application of manure, at an expense not exceeding one dollar for every wagon-load, and accompanied with the use of plaster and clover, yields an annual profit of thirty-six per cent. Rather a better business than shaving at thirty-three and a third, and certainly much more agreeable and honorable. We all know, moreover, that if the shaver loses his money, he must lose along with it the 33⅓ per cent.; so, too, the farmer, who loses a load of manure, loses a dollar which, had it been saved and judiciously used, would have yielded an annual interest of thirty-six per cent. Now the law forbids our taking more than six per cent. for the use of our money, yet what folly do we deem it to throw money away. But the law allows us to make all that we can from our manure: what excessive folly, then, to throw it away, when every dollar's worth of it properly invested will yield us so handsome a return! A wise man has told us that 'a penny saved is two pence clear'; if this be true of money, how much more truly may it be said of manure, that a penny-worth saved is a shilling clear!

"The second Table discloses the fact that the six *clover* crops yield a greater net profit than the six *grain* crops. This will perhaps appear startling to many, but is what all who have investigated the subject were ready to expect. The fact that land in grass yields a higher profit than when cultivated in grain, has been long known and practiced upon in many parts of this country, Great Britain and Europe. The mystery is not that the fact is so, but that any should at this day remain ignorant of it, and fail to reap its important benefits. Col. John Taylor, the author of Arator, in an Essay on Artificial Grasses, published in the American Farmer, Vol. I., page 257, places this subject in so forcible a point of view that I am sure the Society will thank me for using his language instead of my own. He says:

'In Holland, where the cultivation of grass is generally preferred to that of bread, land sells higher as land, without having its price enhanced by adventitious circumstances, than in any other country. The industrious and profit-loving Dutch choose rather to import than to raise their own bread-stuffs at the expense of diminishing the culture of the artificial grasses. They are as little likely as any people in the world to make an election by which they would lose money. In England, the cultivation of grass is so much more profitable than that of bread-stuff as to have obtained a preference at the expense of considerable importations of the latter. The bearings of this fact are weighty. Hay and butchers' meat in England are nearly of the same price as in this country—whereas, wheat there is often three times dearer than wheat here and seldom less than double in price. Yet the English farmers prefer raising artificial grasses to raising wheat. Again, the rent as well as price of land is constantly highest in those countries where the culture of artificial grasses is pushed farthest. In England, the rent of fine artificial meadows sometimes extends to twenty dollars an acre, rarely diminishes to ten, and is never so low as the rent of adjoining arable land, however good. It must be our best lands which would rent at one dollar an acre for a term of twenty-one years; and even at this low rent both the land and the tenant are generally ruined. Now when we see the best grazing lands there renting higher than the best arable lands, and their farms renting ten times higher than ours, does it not plainly follow, that both a great profit and a vast improvement of the soil must arise from the culture of artificial grasses; and that the difference in the rent between their farms and ours is in a great measure produced by the latter circumstance? This conclusion is warranted by the fact that the longer the term of the lease is, the higher is the rent there, and lower here; because the tenant in one case calculates on a mode of tillage which will improve the land, and in the other upon its becoming poorer.'

"We see the same condition of things throughout the United States. Wherever the most attention is paid to the propagation and cultivation of the grass crops, the rents, profits and prices of land are the highest. Indeed it must be so, since the profits of farming consist of the joint products of land and labor, and the greater the proportion of the labor to the total product the higher the rate of profit must be, to make the business profitable. This I am dis-

posed to think is true as a general rule and under all circumstances. I am sure it is the case where *slave* labor is used. Permit me to illustrate my meaning by an example. Suppose a man to invest five thousand dollars in land which can be made to yield three hundred dollars without bestowing any labor on it—say he can rent it for that sum—so long as it continues to yield him that sum it will be a good investment, at all events as good as lending the money at the usual rate of interest. But if, instead of investing all the capital in land, he only lays out four thousand in land and the remaining one thousand in two negro men twenty years of age, for whom he pays five hundred dollars apiece, and sets about to work the land; he must now make more than three hundred dollars, or the investment will not be equal to the usual profits of lending money. In the first place he must make, clear of all the expenses of tillage, (excepting the labor,) enough to pay two hundred and forty dollars, the interest on the capital invested in the land, and sixty dollars to pay the interest on that laid out in the slaves; but besides this, he must feed and clothe the slaves, and also get a farther per centage of profit on the one thousand invested in them, sufficient to yield a sum in the lifetime of the slaves equal to their first value, else he will lose a part of the capital by their death. In other words, he must feed and clothe the slaves, make six per cent. on the money paid for them, and enough besides to supply their places when they die. If, now, we suppose the average life of slaves aged twenty to be fifty-two, he must in thirty-two years make, over and above the support of the slaves and the usual rate of interest on his value, five hundred dollars from the product of his labor—this is about three per cent. per annum for thirty-two years on his supposed value. We may safely put the food, clothing, taxes, medical bills, &c., of a slave at thirty dollars a year, which is six per cent. on his value. Add the three together, the six per cent. interest on the cost, six per cent. for clothing, &c., and three per cent. additional to supply his place when he dies, and we have fifteen per cent. on his value as the amount of profit which slave labor must yield to make it as profitable as land without labor, or money at six per cent. Consequently the farmer who employs in Agriculture a capital of ten thousand dollars, one-half of which is invested in slave labor, must make annually, clear of all expenses of tillage, one thousand and fifty dollars—just ten and a half per cent. on the whole capital, to make it as profitable as money at legal interest; while he who has the same capital, but only one-fifth invested in slave labor, need make but seven hundred and eighty dollars a year, or rather more than seven and a half per cent., to make his capital equally profitable—a difference of about three per cent., owing entirely to the proportion of labor in the two cases. For the same reason lands cultivated in grass, which of all other crops requires the least labor, must yield a larger profit than lands cultivated in grain which require the most labor; and this whether the grass be mown for hay or used for grazing, and altogether independent, too, of the improvement of the land itself, which must be greater in grass crops than when cultivated in grain. Hence the high rents, profits and prices of lands in grazing countries."

Every sign of Nature, and every consideration of policy, invite the agriculturists, off at any considerable distance from tide-water in Virginia, to turn their attention more and more from tillage crops and staples—such as wheat, corn, rye, and tobacco—to grass, butter, cheese,* wool, hops, sheep, cattle and mules. In proportion to the capacity of their land to produce grain, it is far better adapted to grass than lands of same yield of grain on the tide-waters. Clover, white and red, timothy and orchard grass, seem here to be in their natural element, even to the hill-tops; every mountain side on being cleared seems to afford good sheep pasturage, and wherever the growth of grass is too high and rich for sheep—as was found to be the case in some of the western counties, by a large owner of fine-wooled sheep from Pennsylvania, who lately settled in Bedford—Nature invites to the raising of cattle and mules. The flock-master referred to, from Washington County, found difficulty in selecting a site where the bite was short enough for sheep. True, it may be said that if the West has raised up a competitor in growing grain, so has it in rearing stock, owing to the cheapness of rich land, and the grain to fatten hogs and cattle; but the railroads and canals do not offer to the western grazier the advantages they present to the grain-grower to enable him to beat down rivalry on the Atlantic.

For example, take the case which fell under my notice in May last—General Thomas Shelby of Ky., sent four hundred cattle to the New-York market, which took eighty days to travel there, being eight hundred miles at ten miles a day: and at an expense of $6,000, or $15 a head *on the road*. He expected the gross sales to be $32,000, or $80 per head. Thus, however striking after all may be the advantages of the more western grazier, still they are not so irresistible to

[* A Parliamentary Return shows that 341,682 cwt. of foreign cheese was imported into the United Kingdom of Great Britain in 1846. *Ed. Farm. Lib.*]

his eastern competitor as would be his rivalry in grain. Another element to be brought into the calculation, as illustrated by Mr. Minor, is the greater amount of labor demanded for tillage crops, and labor is the great desideratum now in the parts of Virginia which have been drained of it to supply Alabama and other Southern States. The dearness of labor in this country is, in fact, enough to prevent us from supplying any English demand for wheat, unless under extraordinary circumstances of a general scarcity on the Continent. Europe—where field-labor is about twelve cents a day—is the true wheat region of the world. Take the extent of that Continent, as estimated by McCulloch, at 3,650,000 square miles: and four-sevenths of this, or 2.000,000 square miles, (about the entire area of the United States, exclusive of Texas and Oregon,) is adapted to wheat.

The better to judge of the accuracy of Mr. Minor's estimate as to the average price there given, as well as for other and general calculations and reference, it may be well to put down here the averages for a series of years at different mills and markets in this country. At Brandywine mills, Delaware, the average of the prices paid from 1815 to 1841, both inclusive, was $1 34½. In the New-York market, the average price for ten years, from 1836 to 1845, both inclusive, was $1 25. At Baltimore the average price for thirteen years prior to 1845, was $1 24. At Philadelphia from 1815 to 1841—a period of twenty-seven years—the annual average was $6 71 per barrel for flour.

The flour of the Valley of Virginia, when transported on the Macadamized road to Winchester in wagons, costs for transportation about one cent per mile, or fifty cents from Newmarket, 48 miles. It is usually taken as a business in wagons drawn by six heavy horses, 40 barrels being the usual load; but teams have been often known to take 10,000 weight. The usual travel is eighteen miles a day. The cost of transportation from Cumberland to Baltimore, 178 miles by railroad, is the same as 48 miles from Newmarket to Winchester, and the freight on flour from Chicago to New-York, 1450 miles, is but $1 37 a barrel—or 34 cents a bushel.

From Detroit	$1 17½	or 28 cents per bushel
From Buffalo	97½	or 23 -- -- --

Such is the difference between horse-power, even on the best Macadamized roads, and more artificial conveyances and water transportation.

Let not the Virginia farmer—on exhausted land and far from market and the facilities of river navigation—be deluded by the hope of extraordinary prices, such as we have had, under an extraordinary combination of circumstances. We have seen that Mr. Minor's estimate is the only safe one. The official average in Great Britain, for seven years ending 1844, per imperial bushel of 60 pounds, was only $1 68. The average at our Atlantic ports has been $1 25. It is known that ordinarily the price of freight, and all charges from New-York to Liverpool, is at least 33 cents; lately it has been 50 cents, but putting it at 33 makes the price of American wheat in Liverpool $158, leaving to the shipper only 10 cents for his trouble and risk, supposing the Corn-Laws never to be renewed. They only, then, it is clear, can safely go on making and depending upon wheat and corn, who have the resolution and perseverance to follow out the system indicated so clearly by the author of this Address.

In opposition and contrast with the general management here spoken of, I am glad to record a remarkable evidence of a different spirit existing in South Carolina, as evinced by the example of the gentleman whom I persuaded to give me the following written transcript of what I had previously learned from him in conversation at the White Sulphur Springs, where may be met every year a number of southern planters eminently distinguished for their intelligence and their affability when you meet them abroad, as I know them to be for their hospitality, industry and humanity at home. Would that certain farmers of whom I have heard, not many miles from the shores of the Rappahannock opposite Port Royal—farmers who have inexhaustible and as yet unbroken beds of marl on their farms—could see in this paper the proof of the spirit of improvement roused by the explorations of Mr. Ruffin in Carolina. Are not such listless farmers in Caroline afraid of being haunted by the spirit of Arator, indignant at their neglect of his admonitions?

THE USE OF MARL IN SOUTH CAROLINA.

White Sulphur Spring, Virginia, Aug. 3. 1847.

Sir: You asked me to put a part of our conversation yesterday, on the subject of Marl, on paper. I commenced marling about the last of February, 1845, on the plan Mr. Ruffin recommended to the people of South Carolina, where he had been engaged by the State in making a Geological Survey of the State. I flush up the field to be marled with a two-horse plow, as deep as I can have it done with that team and plow; then I lay the field off in acre lengths and widths—each acre into twelve squares—into each square I haul a two ox-cart loads of pen litter and scatter it broadcast by hand from fanners or small baskets; then I haul twelve cart-loads,the same as above—a cart-load into each square, and scattered as above—then I cover the land marled with a single horse-plow; and when the season arrives for bedding, I bed-up with a winged plow and dress off the beds with a hoe. The marl-bed from which I haul is on the Pee Dee River, thirty-six miles by land below my plantation, and above tide-water, and with a descending current of two or three miles to the hour. Computing two for one, which is less than is generally estimated, I believe between land and river distance I must have, you see, seventy-two miles to boat the marl up stream. I use what is called a pole-boat, worked by six able-bodied men and a coxswain or helmsman. I give my men 10 days to make the trip, (viz., 1½ days to descend, 1 to load, and 4 to 5 to ascend, 1½ to unload and the balance to rest). I load by laying the boat alongside of the marl-bank (where there is always deep water,) and after throwing off the superincumbent earth into the river, the marl is spaded up and pitched into the boat. The crew can carry between 6 and 700 bushels only—it weighs about 100 lbs. to the bushel. I unload by wheelbarrows working on a platform of plank raised from the deck to the shore.

1845 was a very dry year, and commencing late, I did not marl more than 15 or 20 acres, but in that year the effects of the marl were very visible in color and increased growth. In that year the river soon became too low to boat, and I made little progress in marling. Last year the effects of the marl of the first year were much more striking—this year more than the two preceding; and when I left home, 15th July, the marled land which was in cotton was from two to three feet high, while the adjoining acres, in all respects alike (viz., soil, plowing and manuring,) was not higher on the stiff old lands—not more than 6 or 8 inches. The marled cotton was of a deep and vigorous green, the unmarled pale and sickly. I am so far from my plantation that I have not been able to say what difference there is in the maturity of the plant or increase of products; but I have no doubt the difference must be very considerable.

You asked me if I had ever made a calculation of what the marl cost me. I have not, but from the data given, you will see the cost must be great, in addition to the cost of boating, (and I have to haul it two miles, and some part of the way through a deep swamp,) to the fields I am marling. But notwithstanding all the difficulties of distance, time, and loss of labor, I think I shall be amply rewarded in the end, or some one else who may succeed me as owner. I do not plead guilty to the charge you make justly against the Virginians of abominable laziness and negligence in *saving and making manure*. I do much in that way, but might do much more. I have marled some corn, but cannot say that the effects with me, although visible, were so strongly marked as cotton.

If anything in the above note is worth extracting, and may incite the young to do what an old man has commenced, use it, if not, fling it into the fire.

The marl I use (by Ruffin's Analysis,) is about 75 or 80 per cent. of lime.

J. D. WITHERSPOON.

Writing, as we ramble in these mountains, not according to any fixed plan, I must now turn you back for some farther remarks on the

AGRICULTURE IN THE VALLEY OF SHENANDOAH AGAIN: LIME, PLASTER, COST OF LABOR, &c.

My last, from White Sulphur, was eked out by a letter from Mr. J. D. Witherspoon, of South Carolina, sent, as much as for anything else, to show to certain gentlemen on the Rappahannock and elsewhere, who have untouched marl-beds on their own estates, what a man of energy can do.

On Friday we set out to sojourn for a few days at *Walnut Grove*, where we are at "this present"—7th August, 1847.

This noble estate was the property of the late Col. Beirne, formerly of the Senate of Virginia, and more recently a Member of Congress from this District. Of this celebrated grazing establishment, more will be said after it has "cleared off," so that I can ride over it to survey his meadows, his horses, and his two or three hundred fat cattle, in company with its present hospitable proprietor, O. Beirne, Esq., on whom the homestead worthily devolved at the death of his father.

Though now busily engaged, on a very large scale, in the great marts of

New-York and New-Orleans, in (it may be) a more lucrative, though I should think far less captivating pursuit, Mr. O. Beirne was early imbued and has grown up with a thorough practical knowledge of the economy and business of breeding and fatting cattle; and still, as is quite evident, though extensively embarked in the more exciting and gainful business of commerce, clings with the partiality which its own amusing nature and early associations beget, to this most attractive department in all the wide field of Agricultural Industry. It is easy to see that he unites the amateur with the connaisseur, in his judgment and admiration of his yearlings and two-year-olds, his lots of spayed heifers and his fat bullocks. As well in knowledge of this business as in the spirit that prompts him to leave it for more active pursuits, he displays an example, but too rare, of those who are not to be enervated by the certainty of a large inheritance.

This magnificent property, as possessed and improved in its entirety, by its late owner, Col. Beirne, consisted of 5,000 acres, laid off into fields of irregular shape and size, of from 50 to 200 and 300 acres, by exterior and cross-fences, of not much (if any,) short of 100 miles in their entire length. How much of the forecast that distinguishes the good from the bad farmer has been evinced in thus keeping property so extensive, in a state of constant activity, and yet not only maintaining, but increasing its productiveness, and that, too, beyond the reach of the artificial fertilizers which some localities present! This is indeed to "act well your part."

Walnut Grove is situate within a mile of Union, the county town of Monroe, which lies on the road from the White to the Salt Sulphur, and within four miles of the latter, in a limestone and blue-grass district. I observe, in near proximity to the mansion, a superb park of Sugar-Maple, with here and there a Walnut and a Buckeye shading a soft, deep green, grass carpet, all as beautiful and perfect in their way as in that splendid region around Lexington, in Kentucky—justly admitted to be the garden spot of the Union, and once part and parcel of this good Old Dominion.

Thus confined within doors by rain for the moment, I send you for preservation a letter received too late for my last, from a gentleman who enjoys among his neighbors the high distinction of being considered an *exemplary practical farmer*, and yet, in the estimation of wise and considerate Members of Congress, elected by farmers, and therefore, as we have a right to infer, considered by farmers themselves as not worthy to be mentioned or thought of the same day with any man who can prove that, with his own good Andrew ferrara, he has, in some field of blood, caused some half-dozen fellow-creatures, formed, as we are told, in the very image of their Maker, to "bite the dust!" Such is the boasted wisdom and humanity of Man,—the "Lord of the Creation,"—such his boasted *progress* toward infinite perfectibility and goodness!

To Mr. ——: NEWMARKET, Shenandoah County, July 23, 1847.

Dear Sir: Your letter of 7th inst., directed to Samuel Moffett, Esq., and myself, was handed to me by Mr. M. with a request that I should try to answer your several inquiries. You ask the favor of myself to state on my own observation and knowledge, and that of my judicious neighbors—1st. At what price, generally, could unslaked lime be burned or bought in this neighborhood?

Answer. Lime cannot be burned so cheap here as in many other parts of this country—first, because wood is too valuable; secondly, because no one makes a business of burning lime in this vicinity, therefore the business is but imperfectly understood. I have had four kilns burned—principally to spread on my lands—by as many different persons, (two of the kilns large,) but have been fortunate enough to get but little more than one-half the stone made into lime. Some of those persons boasted much of their knowledge in the business. I cannot speak positively what my lime cost, but suppose it did not cost me less than 10 to 12½ cents, calculating the quarrying, the wood, hauling, board, and charge for setting up and burning. I have several times bought of my neighbors from 2 to 400 bushels at a time, delivered in one or other of my fields, for which I paid, in the unslaked state, 16⅔ cents per bushel [equal, we suppose, to 8 cents slaked].

2d *Question.* Is it used in—(*could not read your words*)*—and if not, why?

3d *Question.* Has it been tried, and with what effect?

Answer. Lime has not been used much in this vicinity. Some few of my neighbors have tried in a small way, but unfortunately they used what we call the gray limestone, without

* The illegibility here mentioned has caused many errors to appear in these communications from our correspondent, which the reader will please rectify as he goes along. [*Ed. Farm. Lib.*

deriving much benefit from its use. Professor Rogers says the lime used for agricultural purposes should be what we call here the blue limestone, and adds that it should be the blue-black limestone. My last kiln used on land was all of this kind of stone, except the arches, which were of the gray limestone. This kiln was of more service to my land than all the lime I ever purchased and all I ever had burned. I will now tell you, as nearly as I can, how I proceeded to use this lime. First, I had a large field nicely plowed which had been much exhausted by bad management—much of it quite bare, and the soil washed away. On the third day after the last wood was put in the kiln, it was cool enough to handle. I commenced loading and hauling the lime, first going over the field and putting down small pieces of shingles where I wished half a bushel put in a pile. I laid off 35 acres of this field, part to contain 30, 40, 50, and part 60 bushels unslaked lime. Fortunately for me, Providence sent a fine shower of rain soon after we finished hauling out the lime. This put the lime into flour. For fear another shower would put it into dough, I put all hands to spreading; then put four of my harrows on it, and I think we harrowed it three times to incorporate the land with the lime; I then sowed it to wheat, putting it in in the usual way. Having stirred it so much, the land and lime were well mixed, and produced me a very fine, clear crop of wheat, with a strong growth of clover. I have since had this field in corn—a fine crop—following it with wheat, which turned out uncommonly well. It is now well set in clover. This is the only field that I can boast of as being much benefited by lime, and this I attribute mostly to using the right kind of limestone. I have several times used lime in compost-heaps with a good effect.

4th *Question.* Is plaster of Paris or gypsum much used; in what way; in what quantity; with what effect—and what are the objections, if any, to the use of it? What is the cost of it here per bushel?

Answer. Plaster of Paris is much used here, mostly sown on clover, at the rate of 2 to 5 pecks on the acre, and is frequently mixed with an equal quantity of ashes (leached); plaster is also used to roll wheat and Indian corn in; it is sometimes sown on the growing wheat —but this should be done not *later* than 15th March, for fear it will ripen early. You will seldom hear any one complain of the use of plaster but those who over*stock* themselves and leave *no grass on the land.* I have used plaster for about thirty years pretty freely, and have not as yet felt any loss, but certainly a gain, from its use. It must be used judiciously. I have this spring and summer used 9 to 10 tons, and some of my neighbors have used it as freely as myself, and heretofore with profit. Plaster costs us here about 40 to 42 cents per bushel.

5th *Question.* Have your lands generally diminished or increased in produce the last twenty years?

Answer. Our lands in this vicinity have generally increased, and my own opinion is that there is a spirit of improvement pervading among the farmers for several miles around us.

6th *Question.* Might not oxen be more extensively substituted for horses to advantage for field labor—I mean for the plow?

Answer. Oxen have been of but little use for plowing; those who have them use them mostly in hauling out feed for cattle during the winter and spring months. The use of oxen is not so well understood as it is in the North. If we could obtain those having a quick step they would be more used.

7th *Question.* Does or does not the Valley suffer more than formerly—say 40 or 50 years ago—by drouth? What say the old people? Was it not formerly better watered than now?

Answer. Having resided in the Valley from 1790 to the present time, I can perhaps say as much as most persons on this subject. Judging from many springs that were, fifty odd years ago, considered good springs, affording plenty of water, which are now dry, I must conclude there is not as much water as formerly. [The same answer holds good in the limestone part of Monroe County.]

8th *Question.* The usual wages given for white labor by the month? Are they conveniently to be had of a good description?

Answer. White laborers generally obtain from $7 to $10 per month, and good ones can be obtained.

9th *Question.* Where Negroes are allowed in meat, instead of having it cooked for them, what is the average allowance in the Valley Counties for each working hand?

Answer. In this vicinity I know no one who does not have the victuals cooked for his slaves. Generally as much is set down to them as they wish to eat; and most of them work easy and are well clothed, and on holidays frequently dress finer than their masters and mistresses. [This is the universal testimony.]

Having answered your several questions to the best of my ability, I hope, if you incline to publish any part of this letter, you will be so good as to improve my language; you will readily perceive I am no grammarian.

[Grammarian or not, I have made no alterations. As to the language, it is just the right sort—plain and clear, without flourish or pretension.]

I took the old American Farmer for many years, and think I derived much information from it. I have the different volumes tied together, with a view of having them bound. I have taken the Albany Cultivator for several years, and am much pleased with it. I hope

you will derive much benefit from the use of the White Sulphur Springs. In hopes this may find you in improving health,

I am, very respectfully, your obed't serv't, JOHN STRAYER.

The preceding letter suggests to me that I ought not to omit this occasion to recommend to every parent and farmer in the United States who has a son destined to be a farmer,—I won't say to follow in his own footsteps—for Agriculture, like other arts and manufactures, ought to be progressively improving,—to place in his hands that greatest of all agricultural works, "THAER'S PRINCIPLES OF AGRICULTURE." So highly do I think of it, that had I a son so situated, to whom I could give only that volume or $100, I would not hesitate a moment in giving him the former;—the whole of which is embraced in your first volume. I may overrate it, but such is my impression of its extraordinary value to all who have made up their minds to follow Agriculture as a business connected with various elegant studies, and depending for its highest success on principles which demand for their investigation a high order of intellectual attainment and power. In connection with Mr. Strayer's letter as respects the use of Lime, I may refer your readers, without straying from the subject, to the whole section of Von Thaër, Part I., consisting of fifty-six pages on "MANURING THE SOIL." It cannot be too often or too carefully studied. There is always danger of impairing the force of an Essay, and even of subjecting the author to be misapprehended by quoting detached portions of it, yet at the risk of that, as Von Thaër is one of my companions, I must beg room to quote here what he says, not only on other points of "pith and moment," but especially on

THE IMPORTANCE OF A THOROUGH INCORPORATION OF THE LIME WITH THE SOIL.

"It is indispensable that the lime should be intimately and completely blended and incorporated with the soil, so that every particle of the former substance shall come in contact with some particle of the latter and act upon it. Unless this circumstance is carefully attended to, the ameliorating effects of the lime will be very trifling; the greatest possible care and circumspection should therefore be bestowed on this point. Even when lime has been spread over a soil that has already been fallowed and harrowed, the land must be harrowed once more during dry weather, and then plowed with as shallow a furrow as possible, in order to bury the lime. The best way is to make use of the extirpator, which effectually combines the lime with the soil. The land must receive at least four separate operations of tillage, including those appertaining to the sowings, with the plow and the harrow, or with the extirpator; and all must be performed during dry weather. It is, therefore, indispensably necessary that a dead fallow should be given to land which is ameliorated with lime. It is chiefly from this circumstance that lime produces the effect attributed to it, namely, the destruction of those weeds with which the soil is infested. But if we bestow an amelioration of this nature, without at the same time bestowing all those operations of tillage which this amelioration requires, we have no right to expect the advantages which we might otherwise derive. If too small a quantity of lime is employed, it is not productive of any effect; while on the other hand, if it is applied too profusely, it is injurious, because it then becomes transformed into heaps of mortar and gathers into lumps. When buried by one deep plowing, it forms a calcareous crust beneath the layer of mould turned over by the action of the plow, which crust so much impedes the progress of that instrument that the layer of vegetable mould becomes sensibly decreased. This is frequently found to be the case in countries where lime is very cheap, and where it is used too profusely.

There are various opinions with regard to the quantity of lime which ought to be applied to different soils in order to effect their amelioration. The smallest proportion which has ever been used is sixteen bushels per acre; but I have seen and heard of this quantity being increased to one hundred and fifty bushels, especially on newly-tilled soils. English agriculturists, I believe, apply even more than that quantity. The quantity used ought to depend upon the quality of the lime—that is to say, upon its purity, or upon the quantity of sand or clay that is mixed with it. If the calculation is made according to size or measure, that will be influenced by its compactness at the time of being measured. Besides, the nature of the soil ought also to influence the proportion, since an argillaceous soil which contains a great quantity of undecomposed vegetable matter, or which is of a marshy nature, although actually dry, can bear a considerable application of lime, and will profit by it; whereas a sandy, loamy soil would be injured by so large a quantity. Lime is not productive of any effect on damp, wet land. Lastly, we must carefully distinguish between the application of lime which takes place once only, and that which is alternated regularly with stable manure. The former is only used to effect that permanent and durable amendment of the soil which may be expected from lime, if applied in the manner and under the conditions which we have prescribed; the latter, on the contrary, is intended to maintain it in fertility.

The quantity of lime used to attain the first of these two objects ought to be very considerable, while that which suffices for the latter purpose must be small, and always proportion-

ate to the quantity of manure which is applied to the land; for, in the latter case, it is customary to alternate every three or six years between the use of stable manure and that of lime. There are, however, some countries where lime is applied regularly every third year —that is to say, at every fallow it is applied three or four times in succession before it is again supplied with stable manure. But this course of proceeding exhausts and impoverishes the land to the greatest possible degree.

The most various and contradictory opinions have been put forth with respect to the advantages or disadvantages attendant on the use of lime as a manure, and we can only find our way out of this labyrinth of conflicting statements by means of a theory based upon solid foundations; with the assistance of such a theory, all that at first sight appears problematical, with regard to the subject, will be speedily elucidated. Lime, especially when it has recently been calcined, or is, in other words, what we call quicklime, absorbs the carbonic acid which is contained in the atmosphere which surrounds it, and subsequently communicating it to the plants, doubtless furnishes them with some nourishment; but this nutrition is very inconsiderable: the property to which it owes the chief power in promoting vegetation is the faculty of decomposing the humus and inert vegetable or animal substances which it meets with in the soil, and transforming them into nutritive juices adapted to the nature of plants. Hence arise the wonderful effects which it produces when it encounters a great quantity of these substances. Besides, when properly employed it contributes greatly toward the destruction of weeds. Hence, we see as rich crops derived from a first, and sometimes from a second, application of lime, as would have been produced had the land been abundantly manured with stable dung. Many persons who have not rightly comprehended the cause of the effects produced by lime, prefer it to manure, and have believed in the possibility of doing entirely without the latter; but the total exhaustion of the soil which such a course of proceeding must sooner or later produce, caused them to fly to the opposite extreme, and to regard the use of lime as an application in the highest possible degree prejudicial and dangerous. An enlightened and scientific agriculturist will soon perceive that the use of lime can never supersede that of dung, but that it renders this kind of manure more energetic in its action. Thus, he will profit by the increased fertility which lime bestows on the first crop which succeeds the application of it, and will procure as much as possible of those substances which are adapted for the production of dung, in order to restore to the land, in the shape of stable manure, that substance of which it has been deprived by the lime forcing and increasing the vegetation of the crops to which it was applied. He will likewise know when lime will be beneficial and when injurious; and, if he acts with moderation, will be able to employ lime with much advantage in cases where many persons would be afraid to use it."

The reason of my inquiry about the effects of plaster of Paris, was because I had been told by the intelligent proprietor of the hotel at Newmarket, (who, or I am much mistaken, has himself inhaled the anti-pulmonary odor of fresh-plowed ground, and the sweet breath of cattle fresh from the clover-fields,) that an impression existed with old farmers thereabout, that frequent crops of clover had a tendency to produce too much *stiffness in the soil*—but I feel satisfied that they mistake in this case, as in many others, the cause for the effect. The stiffness they deprecate is more probably produced by their close and severe grazing, year after year, without leaving their entire crops ungrazed occasionally, to be turned in. And it may be mentioned that a much more certain injury resulting from the use of plaster, and from its strong and immediate action favorable to the growth of clover is, that it makes the indolent farmer become insensible and indifferent about the increase of his *barn-yard manure*, a great and an honest resource of his own providing—one that a diligent and courageous agriculturist will pride himself upon and always husband with the greatest care. See what Von Thaër says of its importance in combination with lime. The use of that, too, it may be apprehended, has the same effect of begetting a dangerous carelessness about the accumulation of animal manures, without which, as it has been stated, in occasional alternation with lime, the latter will be sure to leave the soil at last exhausted of all the elements of fertility.

Before closing these hasty commentaries on Mr. Strayer's letter, one remark farther may be made upon it: you perceive, Sir, that he took and *carefully read* (there is something in that) your old AMERICAN FARMER—the file-leader of agricultural papers in this country—and that since you gave it up he has for years taken the "Albany Cultivator." Now, Sir, with all the senseless cant so easily uttered against 'book-farming,' (as if a lawyer or a doctor should cease to be trustworthy for being well read in their professions,) this constant reader, as well as others in that neighborhood, of all that is going on in their own pursuits, happen to be, by common consent, the very best practical farmers in their

settlement, and are so proclaimed to all inquiring strangers—and is there no true and solid honor in that? Would you not covet for your son's brow such a chaplet as that, in preference to one stained with human blood, or to a fool's cap! Put this question, Sir, plainly and plumply to the public, and inquire whether any man of real discernment, having an honest and well-founded regard for his sons, ought not to be ashamed to look them in the face if he withholds from them the means of becoming instructed in the principles and the literature that belong to their profession in life, and are necessary to invest it with all that is in it either interesting or ornamental in the view of men of cultivated minds. As for your old American Farmer, Mr. Editor, it contains, undeniably, a vast mass of facts and results of experiments. It skimmed the cream from scattered vessels of long standing—cream that but for the receptacle thus provided would have been lost, much of it, to the world—to that we may at any time turn for mere facts, but, except for new and raw inquirers, these are comparatively not needed. We all know what can be done with abundant means—with plenty of wagons and carts, and men and horses—with good, thorough plowing and harrowing, and laying thick ashes, and stable-manure, and guano, and lime, and plaster, and bone-dust, and poudrette—for money used with judgment and energy will tell in Agriculture as in Commerce and Manufactures. But now we want to know the *how* and the *wherefore*, so that, of such materials as ordinary farmers may command, no waste may be committed by ignorance of their proper combination and of their adaptation to the crops we have in view, but all be used with that true and exact economy which is only to be obtained by knowledge of the principles involved in every step we take—by a knowledge of what is inhering in the soil, and in what it is deficient in reference to the crops we propose to cultivate; and how much of the several elements of fertility a given amount of each crop will draw out of and convey off from the land. The same as to animals: the food best adapted to the objects we have in view, and how and in what state their various food may be most economically administered. This, Sir, I rejoice, for one, to see, is the high and glorious destiny—the destiny of an intellectual organization and operation for Agriculture—at which you are aiming. Its friends implore for you the all-powerful coöperation of the general press. With its aid, such impetus and direction may be given to public sentiment as that we may hope yet to see the time when all these things shall be taught in our schools, with the same conviction of their utility, and the same practical results, that the Government, representing and supported by the landed interest, now takes care to have taught and diffused the principles involved in the science of war, and even the knowledge of the foreign language in which those principles are best expressed. Ah, Sir, can the landed interest which you advocate, and for which you have been laboring for thirty years, but be brought to *think!*—The Press only can stimulate them to that; that can beget with farmers the will to extort justice for themselves—and when there is a will there will soon be found a way!

GRAZING, AS CONDUCTED AT WALNUT GROVE, MONROE COUNTY, VA.

Since closing my last dispatch I have had the pleasure to ride, again and again, on a fine, high-bred four-year-old, as playful as a kitten, over this extensive domain. As we passed from field to field of new-mown hay or verdant pasture, among herds of assorted cattle of all ages, some browsing in the open fields, others chewing the cud in the grateful shade of trees that shoot up 40 or 50 feet without a limb, I could not but imagine how the "Farmer of Kinderhook," worthily distinguished for his success in some useful and popular departments of Horticulture, must have been impressed with the great extent and unsubdued fertility of a single estate bought and thus improved by the rare industry and enterprise of an individual coming from abroad, and wending his way from the tide-waters of the Old Dominion, to carve out for himself an immense fortune here in her western wilderness! What an example of energy and thriftiness was that of Col. BEIRNE for her thousand sons that are whiling away their lives in listlessness and despair! as if our unbounded and yet infant country did not present a thousand avenues of independence to the resolute and industrious! Alas! the misfortune is, that those who have been reared in the remembrance and use of the old silver tankard, can't bring themselves to drink out of a gourd; but the sooner they learn to grapple with their difficulties, the sooner will they be able

to redeem or renew the old family plate. On the industrious man Despair may look in, but he dare not enter, as Poor Richard says. But, Sir, lest you should suppose that high-bred colt is off with me, sure enough, let us return to our subject.

What, in this estate, must forcibly strike a Lowlander on riding over it, is that you *nowhere see a field of level land!*—no plains covering the tops of hills—no outspreading intervales at their feet. All is precipitous or rolling; and yet nowhere a sign of a wash or gully—no broken surface, nor anywhere a drop of stagnant water, not even in the bottom of the "Devil's punch-bowls" or "sinks," so numerous as to have given to this region the name of the "Sink Country." These sinks sometimes comprise acres of ground, descending in regular form, to the depth, it may be, of fifty or a hundred feet to the bottom, which is not larger in proportion than the bottom of a mill-hopper, and yet the water, after the heaviest rain, runs through as through a seive, never remaining long enough to drown a spear of the grass; on the contrary, the grass which grows there is, if anything, greener and more luxuriant than elsewhere. A view of these numerous sinks or caverns—characteristic of limestone districts in this State—and other features of the country, lead one to imagine that the whole district was in a liquid, boiling condition, and by some great spasm or paralysis of Nature, was suddenly cooled and left *in statu quo*. Nothing but the sight of it can prevent you from deriding my hypothesis as the wayward stretch of a crude imagination. Well! *n' importe*. One thing, however, cannot be denied, in view of these mountain farms, that they indicate by their great healthiness for man and beast, and their apparent uniformity of productiveness, the soundness of the great principles of *thorough draining*, which constitutes the leading feature of the systems now in progress for agricultural improvement in Europe. Here, where not a drop of water lies anywhere on the surface for a moment after it falls, the foot, the sides, and the tops of hills, over hundreds of acres, whether cleared or in wood—all parts seem alike fertile and verdant. At the top no less than the base does the timothy flourish until eaten out by the yet more nutritious and fattening blue-grass, which takes final possession; and such seems to be the nature of all this region—with this distinction, that where the oak is the principal growth, there the land is more gravelly, throws up an undergrowth of wood, and is better adapted to *grain*, while the prevalence of the maple, and buckeye, and walnut, shows more fitness for grass, and, like the blue-grass lands in Kentucky, is clear of undergrowth; so that I would not, with a fair chance for the brush, hesitate to drive even my "Marylander" colt through it at the top of his speed in a fox-chase. In equal luxuriance, 't is true, you see the timothy covering the much less expanded but equally precipitous hills at Hayfields and other farms on the Gunpowder, in Maryland; but their fertility has been maintained by heavy doses of lime and manure, rendered indispensable by more frequently alternating grain crops, and by *selling the grass off the land*. Here it has been, so far, kept up, and promises to be continued, if not augmented, by the happy effects of a sagacious and self-supporting system of *grazing*, so well conducted that nothing is carried off, but everything *restored to the land*. Pouring in the grain as he takes away the meal, the grazier's hopper is always full. How different with the grass farmer, who sells his hay in the cities! He should remember that he can't eat his cake and have it too. Small leaks sink great ships, as Poor Richard says. In fact, the great beauty and conservative operation of the *grazing* over the *tillage* system, which it behooves the farmers all along the line of our travel, to remember, consists in the fact that the former pays on the spot what it borrows from his estate, and that it requires, comparatively, but a small quantity and cost of labor in proportion to the money results.

But I must not detain the reader, by ill-digested remarks of my own, from the following. He will please remember that this exposition of my kind host, Mr. Beirne, does not purport to be anything like a regular dissertation on this beautiful branch of agricultural industry, for which I had no right to ask, but is to be considered merely as a transcript of his answers to categorical and desultory questions propounded by me casually in the course of our rides over his farm, which questions, without being here repeated, may be understood from the nature of his answers. A greater measure of personal experience, and some time for deliberation, would have enabled me to frame my inquiries with more pertinence, and

to have thus procured, from the fullness of the respondent's information and his frank and courteous disposition, a much more complete exposition of the whole subject, for the use or amusement of those who may desire, as I did, a more exact notion of the manner in which the grazing business is carried on.

ANSWERS OF O BEIRNE, ESQ., TO INQUIRIES PROPOUNDED IN BEHALF OF THE EDITOR OF THE FARMERS' LIBRARY.

I breed but a small proportion of the cattle grazed on my estate—say 30 out of 250. I think a larger profit can be made by buying up and *grazing* the common stock of the country than could be by breeding entire; and a much larger profit might be made, in my opinion, by grazing the improved breeds, if they could be obtained.

I procure my stock cattle from the south-western counties of the State—Tazewell, Russell, Smyth, Scott, &c. &c. They are bred in lots of from 5 to 50, by the small farmers of the country, according to the extent of their farms and means. They are fed in winter on the offal of the farm, hay, straw, fodder, &c.; in summer on mountain range—and are generally fat in the fall when sold to the graziers or speculators.

Stock cattle purchased in the fall for grazing the following summer, are 3, 4 and 5 years old—five-year-olds preferred, fattening more kindly at that age. Very little difficulty is experienced by the breeders in keeping their stock together in the range. The usual mode is to put a bell on one that was ranged the preceding year; they soon become accustomed to, and are not apt to wander beyond its sound; it also enables the owner more readily to find them when salt is required, which he usually gives once a week, taking care always to salt them as near the same place as the nature of the case will admit. The usual quantity of salt allowed to each bullock per week is about half a pint.

The mountains of Western Virginia generally afford good range for cattle during the summer and fall months. The pea-vine is esteemed the best range; there are, however, many weeds and shrubs very near if not quite as good.

I am sorry to say, very little enterprise has as yet been manifested by the people of this country in the improvement of their stock by the introduction of bulls of improved breeds or otherwise. As a stimulant I sell my half-breed Short-Horn calves at three months old, for $10; and but very few are willing to introduce them even at that price. I also permit my neighbors to bring their best cows to my bull free of charge, and but very few even avail themselves of the opportunity.

I purchase my stock cattle in the months of September and October, and commence feeding on hay, straw and fodder from 15th December to 1st January; although it often occurs, when the fall season is propitious for the grass crop, and not obstructed by snow, the cattle will live throughout the winter, and do much better than upon the most abundant allowance of dry food. I cut up my corn and husk it out in November, feed the stalk, fodder and shuck together, and consider it *the best of all the dry feeds*. Oat-straw is not generally esteemed, in this country, as good food for cattle. I usually cut my timothy immediately after the blossom falls, which I think the proper time.

My father has carried through the winter as many as 650 head of cattle; 525 is the most he ever grazed in one year. I should suppose about 25 per cent. is added to the weight of the stock from the purchase to the sale. They are grazed in lots of from 20 to 50; they fatten better in small than in large lots. The Durham stock, well handled, at four years old are worth double the common stock. Cattle are never stabled in this country in winter; the food is scattered out to them on the ground from a wagon in the woodland pastures. I frequently meal my cattle when first turned to grass, for a month or six weeks, at the rate of a gallon to each bullock per day.

I am not able to say the precise quantum of hay necessary for each bullock during the winter. Hay cannot be sold in this country, in any quantity, at any price, there being no demand or market. The first of May is the usual time of turning the stock to grass, and I generally sell in August to the speculators who drive to the Baltimore market. I sometimes, however, sell to the stall-feeders on the south branch of the Potomac. $10 per head on the original cost is considered a fair profit; $12, and even $15, is sometimes obtained.

I cultivate my lands, on the average, about *once in ten years* in corn or oats. The corn land I lay down in wheat and rye, and if designed for meadow, sow at the same time in timothy; if for pasture, in timothy and clover mixed, sowed in January. The oat land I invariably lay down in wheat, and sow on it, in January or February, timothy and clover mixed, for pasture.

Timothy and clover are the only grass-seeds sown in this country, and they are exterminated by the blue-grass, (generally, in about five years,) which is no doubt the natural grass of the country, and thought to be the best for fallowing. I usually cut my meadow land about five years successively, and graze as many more. I have no regular rotation of crops, but am governed in the cultivation of the different fields by their condition and circumstances; some of them require much more frequent cultivation than others. I am of opinion it would be better never to cultivate our grazing lands after they are well set in blue-grass—the older the sod the better it fattens. Two acres of our best land is sufficient to graze a bullock. I have never tried the orchard or red-top grass.

I employ some 15 hands—9 males and 6 females—with some 5 small boys, on my estate of 2,000 acres, which I deem sufficient. White labor can be procured at $10 per month. A good hand will cut and maul from the stump 200 rails in a day; 100 is the usual task, which is easily accomplished in good timber by an indifferent hand.

The Negroes of this part of the country are not allowanced, being at all times permitted to eat as much as they desire of good and wholesome food, and are always comfortably clothed.

Western Virginia I think admirably adapted to the growth of sheep. Our common stock, when well taken care of, produce a large fleece, and the mutton is as fat and well-flavored as any in the world. I have no doubt the breeding of improved sheep would be more profitable to the farmers of this country than the grazing of cattle. From 21 to 23 days are usually consumed in driving cattle from this vicinity to the Baltimore market. The average cost or expense per head is from one dollar and fifty cents to two dollars. The average weight of the common stock of this country when in market, (4 years old,) is about 500 pounds net.

The reason of my asking about *salting* was that doubts have been started, founded on partial experiments in England, about the effect of salt; but I cannot doubt that it has its virtue—else even wild cattle would hardly go the distance they do for it. Mr. Erskine, the worthy and very obliging host of the "*Salt Sulphur*," from which I am *now* scribbling, and who has much experience in grazing, says he knows it to be beneficial—that he has observed that salted cattle will *shed their coats* sooner, invariably, than those which are not salted; and this is everywhere, regarded as a healthful indication. Yet there are hundreds of farmers who never give their cattle, intentionally, a particle of salt. Salt and ashes mixed have been highly recommended as a vermifuge, and otherwise wholesome for horses and cattle. In that view ashes are systematically ordered to their horses, by the old mail contractors in the South. ☞ A spoonfull of alum will immediately cure your horse of an accidental founder, so that you may pursue your journey next morning—so says Doctor P. Thornton.

Would any one believe in the continued *stolidity* which prevents farmers, even yet, from having recourse to *cattle of improved blood?* How differently they order things in England! There, at a late (TWENTY-FIRST) annual *lettings* of South-Down rams, by Mr. Jonas Webb, a great South-Down breeder, 67 rams (the whole number let) were let by the season at upward of $100 each! while lately at Mr. Gowen's *sale* of choice Short-Horns, the prices averaged not over $40! Is it any wonder that we witness no general improvement? The reason is that men are *reared* in ignorance of the meliorations that are going on in their profession, and of the principles on which they turn; and *men grown* rarely take to books and the search for knowledge, who have been kept from them when young, any more than they take in mature life to fishing, or shooting, or cock-fighting. But if, as in other cases, boys were taught what appertains to their own particular business, if the boy that is to be a farmer, were also initiated, as he should be, in the principles of vegetable and mechanical and animal economy, he would know already, before he entered upon his art, that breeding from improved animals of true conformation and constitutional temperament, would give him, from the same food and care, the increased profits of which Mr. Beirne speaks from personal observation. But you can't make an *improving* man out of one who does not believe in knowledge, or thinks he knows everything, any more than you can make—to use a vulgar saying—a silk purse out of a sow's ear. I very much doubt, Mr. Editor, whether there are ten men in your own native county, since the death of your father, who read ten pages a year on the very business of their lives, a business essentially intellectual and progressive.

Here you see Mr. Beirne, a gentleman of close observation, great personal experience, and strong powers of discrimination, expressly averring his belief in the superiority, as winter food for cattle, of the *offal of Indian corn* over all the dry fodders, even timothy hay, and yet—so faithfully is the agricultural interest cared for, so careful are they to have rendered a full account of *their* contributions to the national wealth, that *not the slightest mention is made of this, one of their most valuable products, in the Census of our national resources.* But thus must it ever be while farmers are educated in anything and everything but that which qualifies them to comprehend their own interests and the principles of their art; and while scarcely any but lawyers and party demagogues represent and make laws for them.

I trust you and your readers, and especially Mr. B., will excuse these running commentaries on his clear and interesting statement. There is one point of it which suggests one more remark: It is the deliberate declaration of such a man, who has traveled all over the Union, is familiar with its various climates, its course of trade, its agricultural staples, its manufacturing industry—it is his declaration to which I would call attention, to wit: "Western Virginia I think admirably adapted to the growth of sheep. Our common stock, when well taken care of, produce a large fleece, and the mutton is as fat and well flavored as any in the world. I have no doubt the breeding of improved sheep would be more profitable to the farmers of this country [meaning Western Virginia] than the grazing of cattle." What stronger corroboration do I need of the soundness of my suggestions, and of the more elaborate and unanswerable illustrations of Mr. RANDALL, as contained in his admirable Letters, now appearing in your Monthly Journal. Doubtless these arguments apply as well to all the upper portions of the Carolinas and Georgia.

It will be admitted that the Yankees are good at guessing what is best for themselves, and know pretty well how to turn their resources to the best account. You will find in a late number of the "Western New-Yorker," published at Warsaw, the following statement as to the wool business of that county:

"The whole number of yards of woolen goods made at the different factories is set down at 65,518—valued at $51,358; value of raw material used, $23,800. There have been, at the lowest estimate, (and it probably exceeds that,) 500,000 pounds of wool sold this season, by the farmers of our county. Admitting the sales to average 28 cents per pound, which will not vary much, if any, from that, the amount of money paid out for wool will be one hundred and forty thousand dollars—a nice little sum to be scattered broadcast over our county."

An equal sum might be derived from wool in almost every county in Virginia and Maryland, without any diminution of income from other sources.

In the Genesee Farmer I find the following. It will be seen that his Merino sheep averaged nearly 4½ pounds: but putting the average at 4 pounds, his 200 sheep yielded for their wool above $350, saying nothing about their 190 lambs. This $350 is more than fields of 100 acres of wheat will *net* on the average through the State. Rating the 190 lambs at $1 each, the 200 sheep would give $540. But there are factories in the Northern States ready to buy the wool and many other products of the farm on which the wool is grown:

"When I kept the Saxony, 2½ lbs. per head was all that I could get with good keeping; and in rearing lambs I would lose at least 15 per cent., and nearly the same in wintering old ones; and I think there is not as much difference in their size, nor in the quantity of food they eat, as some have intimated. To be sure the Merinos are larger than the Saxony, but the difference is not great. I think that a fat sheep will not eat as much as a lean one, and certainly my Merinos keep in much better order, on the same fare, than my Saxons did, and I seldom lose one in wintering; and in rearing lambs we seldom lose 5 per cent.; and I find it fully as easy to shear 4 lbs. per head as 2½ from my Saxons—and indeed my ewes this year averaged near 4½ lbs. per head, counting lambs and all. My lightest fleece was 3 lbs. 6 oz., and two with lambs by their sides gave 5½ lbs. each, and one barren ewe gave 7 lbs. 14 oz. My sheep were thoroughly washed. The man who bought my wool was much pleased with it, and gave me the top of the market, 37½ cents per lb., cash, for my entire clip. My flock consists of about 200, about half of which are pure bred Merinos of the Paular kind, which I have bred from about 40 ewes and 2 bucks that I purchased from the most approved flocks in Vermont. The other half of my flock is a high cross of the common Merino on the native and Saxony, which makes their wool about as fine as my full-blood Paulars, but do not give near as heavy fleeces. Now I say let every one make his own calculations, and keep the kind of sheep he pleases.

"Very respectfully yours, REED BURRITT.

"*Burritt, Tompkins Co., N. Y.*, July, 1847."

—One more and a much shorter letter will suffice, Mr. Editor, for the few general remarks and reflections that remain on what was observed in connection with their Agriculture during a most agreeable visit to the Springs in Western Virginia.

LONGEVITY OF THE DONKEY.—A donkey belonging to Mr. Gandey, of Brighton, died lately at the advanced age of a hundred years! It was a great favorite with its master, and was well provided for up to the time of its death.

HOUSE-FEEDING SHEEP.

I HAVE two houses for feeding sheep, the one containing 140 stalls, and the other 150. My system has been now several years in operation, and answers my fullest expectations.

The great principle upon which I relied, when I commenced it, was that safe and certain one, that in proportion as an animal is kept warm, clean, well fed, (in other words, comfortable in every respect,) it will improve in flesh and in fat, and will be likely to repay the attention of the feeder. This principle had been safely applied to other animals—to the ox, the swine, the horse, the dog—to many of the wild animals—and, what furnished a still stronger illustration, to birds—for the careful housewife invariably coops her poultry. The ordinary process of reasoning assured me that the same causes which were operative upon other animals would be as certainly operative upon the sheep, and the result has fully justified the opinion.

My sheep are confined in stalls, the dimensions of which I need not give, because it is obvious that they must be regulated by the ordinary size of the breed to which they are to be appropriated. It is enough to say that they should not be so large as to enable the animal to turn round and dirty the trough. Each sheep is confined by a leathern collar, attached to a slight chain (of the size of a small dog-chain) furnished with a couple of swivels, sufficiently long to secure comfort to the animal, but not long enough to hang back beyond the division of his stall, and to interfere with his neighbor. At the head of each sheep is a trough, for the purpose of holding turnips, at one end of which is a division for chaff, bruised corn, linseed-cake, or other food of the kind. Above the trough is a small rack for vetches, clover, or other long food.

In one of my houses a small cast-iron water-trough is appropriated to every two sheep, the entire number of troughs being laid upon a level, and supplied from a tank furnished with a ball-cock.

Under each row of animals is a receptacle for the manure, formed of brick laid in cement. It is about two feet deep, and as much in breadth, and is covered by an oaken grating. A receptacle of these dimensions requires emptying about once in ten weeks. The sheep stand back to back, with an interval between the rows sufficient to allow the barrows, for feeding and for carrying away the manure, to pass freely through the house, and this passage is laid so far below the level of the gratings as to admit of any dirt dropped in the path being swept into the manure-tanks on either side.

The whole of the openings in the stalls are secured by shutters, which in cold weather are closed entirely at night, and which are opened, more or less, according to the weather, during the day.

Gypsum is occasionally scattered along the paths, and swept into the tanks; and, in the absence of gypsum, peat or other vegetable ash, which we find answer a good purpose.

So essential do I consider warmth, that if I were in a coal country I should be inclined to regulate the heat of my ox and sheep houses as we do that of our conservatories—by artificial heat; and I think it probable that the feeder would be repaid by glazing the openings left for light.

My sheep are generally very healthy, and thrive fast; but in this respect they differ very much. In some very rare instances individuals have gained a pound a day live weight. In many instances the average gain, upon a large number, has exceeded three pounds a head per week; but the more general average is about two and a half pounds. It is obvious that the breed and quality of the sheep, the age, the sex, the season, the weather, the food, are all involved in this question. And so in reference to the time occupied in making out the sheep for the butcher. Upon this point it is enough for me to say that the advantage of stall-feeding over the open fold is immense; and it will be, of course, greater or less in proportion as the farm is one in which the soil and the exposure are more or less favorable to the well-doing of stock, and to the feeding-off the turnip crop.

The manure is of first-rate quality, and especially valuable for the drill; not inferior, as I think, to the best guano, made as it is under cover, and containing as it does all the chemical properties of the urine, in admixture with the solid manure. My usual custom has hitherto been to use it with the addition of some bone, either in the raw state, or recently in that of superphosphate. I may add that under this system the growth of wool is very rapid, fully corresponding to that of the carcass.

I have thus told you everything which occurs to me as useful to be known by those who may wish to carry into effect my method of feeding. RICHARD SIMEON.

Swainston, Isle of Wight, Feb. 22.

W. C. SPOONER, Esq.

There are now before the public the details of three methods of shed-feeding sheep—the system of box or pen-feeding adopted by Mr. Huxtable, the method of stall-feeding practiced by Sir Richard Simeon, Bart., and the plan of having movable houses in the turnip-field recommended by other gentlemen. Each system seems to have peculiar advantages as well as disadvantages, but all agree in the economical manufacture and expenditure of the manure. W. C. SPOONER.

[London Gardeners' Chronicle.

LETTER X.

BREEDS OF SHEEP IN THE UNITED STATES.

Enumeration of Imported Breeds...No indigenous ones..." Native " Sheep—their Origin—Views of Mr. Youatt—Mr. Livingston—their true Origin—their Early Increase in New-England..Vanderdonk's description of the Sheep and their increase introduced from Holland into New-Netherland (New-York)...Characteristics of the Native Sheep...Account of the Introduction of Merinos into the United States...Their valuation at different periods...The Spanish sub-varieties—Merged in the United States...Purity of blood of the descendants of the Early Importations...Spurious Merinos...Weight of Fleece of the Spanish and French (Rambouillet) families...Description of the latter...American Families—their Characteristics..Doctor Emmons's Measurements of the Fineness of Wool of individuals of the American, Spanish, and French families —also of other breeds..The Characteristics of the Merino—its Crosses...The Saxon Sheep—its Origin—Varieties—Treatment in Germany...Introduction into the United States...Purity of blood in our present flocks—Weight of Fleece—Characteristics...The New Leicester or "Bakewell"—Origin—Character in England—Introduction into the United States—Valuation in the latter—Characteristics...South-Down Sheep—Origin—Characteristics—Introduction into the United States..Mr. Ellman's description of a perfect animal..Cotswold Sheep—Original Stock—Crossed—the improved variety—Characteristics of—Introduction into the United States..Cheviot Sheep—Importation into the United States—Original Stock—Crossed—improved variety—Characteristics...Broad-Tailed Sheep—Introduction into our Country—Characteristics.

Dear Sir : It is believed by those competent to judge, and who have investigated the subject, that our country now possesses every known *breed* of sheep which could be of particular benefit to its husbandry. In proceeding to give an account of the sheep of the United States, I do not deem it necessary to take up your time with a detailed *history* of each race. The zoölogist or breeder anxious to obtain this information, will find it given with great elaboration and accuracy, in the admirable work on Sheep by the late Mr. Youatt.*

The principal breeds in the United States are the "Native," (so called); the Spanish and Saxon Merinos, introduced from the countries whose names they bear: the New Leicester or Bakewell, the South-Down, the Cotswold, the Cheviot, and the Lincoln from England. The common sheep of Holland were early imported by the Dutch emigrants who originally colonized New-York, but have long since ceased to exist as a distinct variety. The Broad-Tailed Sheep of Asia and Africa have several times been introduced from Persia, Tunis, Asia Minor, etc.

Chancellor Livingston also speaks of two "races as 'indigenous' to this country, which we have not enumerated, as it is not known to the Committee† that they are now bred in any portion of the United States, viz., the Otter and Smith's Island Sheep, breeds said to have been discovered on two islands on our Atlantic coast. An almost infinite variety of crosses have taken place between the Spanish, English, and 'native' families. To so great an extent, indeed, has this been carried, that there are,

* Also in Mr. Bischoff's, Spooner's, etc., (English) works, and Mr. Morrel's "American Shepherd"—the *historical* parts of all of which are compiled mainly from Mr. Youatt

† At the Annual Meeting of the New-York State Agricultural Society, 1837, a Committee was appointed to report at the next Annual Meeting of the Society, on the "Condition and Comparative Value of the Several Breeds of Sheep in the United States." The Committee consisted of Henry S. Randall of Cortland, Henry D. Grove of Rensselaer, John B. Duane of Schenectady, Francis Rotch of Otsego, and C. N. Bement of Albany. These gentlemen were at the time breeders of all or nearly all the most important varieties, and it was expected that each would write that portion of the Report treating of the one or ones bred by himself The Committee, however, desired—or rather required me to write the whole Report, which I did, with the exception of quotations from authors. The Committee met in Albany, prior to the presentation of the Report, and the late Thomas Dunn and several other breeders were present by invitation. The Report was unanimously adopted by the Committee, and assented to by the breeders present. I do not now quote or adopt *all* the conclusions of that Report. Experience has compelled me to modify some of my opinions, and *actual changes* in the breeds have taken place But I have mentioned the above facts, to show the authority on which the statements which I *have* quoted, rest; and also because the Report has been often quoted from, sometimes without any credit, and sometimes erroneously credited.

[To save constant reference, it will be understood that all the matter quoted in this Letter from the Report will, unlike the cases where Mr. Randall quotes at any length from the writings of others, be printed in the same type with the body of the Letter, and simply marked with quotation points. *Publisher.*]

comparatively speaking, few flocks in the United States that preserve entire the distinctive characteristics of any one breed, or that can lay claim to unmixed purity of blood."

NATIVE SHEEP.—"Although this name is popularly applied to the common coarse-wooled sheep of the country, which existed here previously to the importation of the improved breeds, there is, properly speaking, no race of sheep 'native' to North America. Mr. Livingston, in speaking of a race as 'indigenous,' only quoted the language of another,* and his informant was either mistaken as to the fact, or misapprehended the term. The only animal of the genus *Ovis Aries*, originally inhabiting this country, is the Argali,† known to our enterprising travelers and traders who have penetrated to the Rocky Mountains, where the animal is found, as the Big Horn.‡ Though the pelage of the Argali approximates but little to the wool of the domestic sheep, they are, as is well known, considered by naturalists to have belonged originally to the same species; and the changes which have taken place in the form, covering, and habits of the latter, are attributed to his domestication, and the care and skill of Man during a long succession of years.

"The common sheep of the United States were of foreign and mostly of English origin. The writer of the volume on Sheep in the 'Farmer's Series,' [Mr. Youatt,] speaks of them as 'although somewhat differing in various districts, consisting chiefly of a coarse kind of Leicester, originally of British breed.'‖ Others have seen, or fancied they saw, in some of them, a strong resemblance to the South-Downs. Mr. Livingston was of this number.§ But it is far more probable that they can claim a common descent from no one stock. Our ancestors emigrated from different sections of the British Dominions, and some portion of them from other parts of Europe. They brought their implements of husbandry, and their domestic animals, to fertilize the wilderness. Each, it would be natural to suppose, made choice of the favorite breed of his own immediate district to transport to the New World, and the admixture of these various races formed the mongrel family now under consideration. Amid the perils of war, and the incursion of beasts of prey, they were preserved with sedulous care. As early as 1676, Mr. Edward Randolph, in a 'Narrative to the Lords of the Privy Seal,' speaks of New-England as 'abounding with sheep.'"¶

Vanderdonk, writing in 1790, thus speaks of the sheep introduced from Holland into New-Netherland (now New-York) by the Dutch emigrants:—

"Sheep are also kept in the New-Netherlands, but not as many as in New-England, where the weaving business is carried on, and where much more attention is paid to them than by the New-Netherlanders. The sheep, however, thrive well, and become fat enough. I have seen mutton there so exceedingly fat that it was too luscious and offensive. The sheep breed well and are healthy; they find good pasture in summer, and good hay in winter; but the flocks require to be guarded and tended on account of the wolves, for which purpose men cannot be spared. There is also a more important hindrance to the keeping of sheep, which are chiefly cultivated for their wool. New-Netherland is a woody country throughout, being almost everywhere beset with trees, stumps and brushwood, wherein the sheep pasture, and by which they lose most of their wool. This is not apparent until they are sheared, when the fleeces turn out very light."

"The common sheep yielded a wool only suited to the coarsest fabrics, averaging, in the hands of good farmers, from 3 to $3\frac{1}{2}$ lbs of wool to the

* Livingston's Essay on Sheep, pp. 56, 60. † Godman's American Natural History.

‡ The "wooly sheep" of the Rocky Mountains, the description of which is quoted by Mr Morrel, (American Shepherd, p 131,) from Capt. Bonneville, is a *goat*. It will be found described in Godman's Natural History, vol ii. p. 326, *et supra*.

‖ Vol. on Sheep, p. 134. § Essay on Sheep, p. 53. ¶ Colonial papers of Massachusetts.

fleece. They were slow in arriving at maturity, compared with the improved English breeds, and yielded when fully grown, from 10 to 14 lbs. of a middling quality of mutton to the quarter. They were usually long-legged, light in the fore-quarter, and narrow on the breast and back, although some rare instances might be found of flocks with the short legs, and some approximation to the general form of the improved breeds. The common sheep were excellent breeders, often rearing, almost entirely destitute of care, and without shelter, one hundred per cent. of lambs, and in small flocks a still larger proportion. These, too, were usually dropped in March or the earlier part of April. Restless in their disposition, their impatience of restraint almost equaled that of the untamed Argali, from which they were descended; and in many sections of our country it was common to see from twenty to fifty of them roving, with little regard to inclosures, over the possessions of their owner and his neighbors, leaving a large portion of their wool adhering to bushes and thorns, and the remainder placed nearly beyond the possibility of carding by the Tory weed *(Cynoglossum officinale)* and Burdock *(Arctium lappa)* so common on new lands.

"The old common stock of sheep, as a distinct family, have nearly disappeared, having been universally crossed, to a greater or less extent, with the foreign breeds of later introduction. The first and second cross with the Merino, resulted in a decided improvement, and produced a variety exceedingly valuable for the farmer who rears wool only for domestic purposes. The fleeces are of uneven fineness, being hairy on the thighs, dewlap, &c.; but the general quality is much improved; the quantity is considerably augmented; the carcass is more compact and nearer the ground; and they have lost their unquiet and roving propensities. The cross with the Saxon, for reasons which we shall hereafter allude to, has not been generally so successful. With the Leicester and Downs the improvement, so far as form, size, and a propensity to take on fat are concerned, is manifest."

MERINO RAM.

[*Prince*, 17 months old, bred by and the property of Henry S. Randall.]

Spanish Merino.—"The history of this celebrated race of sheep, so far as it is known, has so often been brought before the public that it is deemed unnecessary here to recapitulate it. The first importation of them into the United States took place in 1801. Four were shipped by Mr. Delessert, a banker of Paris, three of which perished on the passage.* The fourth arrived in safety at Rosendale, a farm owned by that gentleman near Kingston, in this State. The same year Mr. Seth Adams, of Massachusetts, imported a pair from France. In 1802, two pairs were sent from France by Mr. Livingston, the American Minister, to his estate on the Hudson; and later the same year, Mr. Humphrys, our Spanish Minister, shipped two hundred, on his departure from that country, for the United States." Hon. William Jarvis, of Weathersfield, Vermont, then American Consul at Lisbon, sent home large and valuable flocks in 1809, 1810, and 1811. The particularly favorable circumstances for obtaining the choicest sheep of Spain, under which these were procured, you will find detailed in a letter to me from Mr. Jarvis, dated December, 1841, published in the Transactions of the New-York State Agricultural Society of that year. Various subsequent importations took place, which it is not important to particularize.

The Merinos "attracted little notice, until our difficulties with England led to a cessation of commercial intercourse with that power, in 1808 and 1809. The attention of the country being then directed toward manufacturing and wool-growing, the Merino rose into importance. So great, indeed, was the interest excited, that from a thousand to fourteen hundred dollars a head was paid for them." Unfortunately some of the later importations "arrived in the worst condition, bringing with them those scourges of the ovine race, the scab and foot-rot. These evils and the increased supply, soon brought them down to less than a twentieth part of their former price; they could now be bought for $20 a head. When, however, it was established, by actual experiment, that their wool did not deteriorate, as had been feared by many, in this country, and that they became readily acclimated, they again rose into favor. But the prostration of our manufactories, which soon after ensued, rendered the Merino comparatively of little value, and brought ruin to numbers who had purchased them at their previous high prices. The rise which has since taken place in the value of fine wool, as well as the causes which led to it, are too recent and well understood to require particular notice. With the rise of wool, the valuation of the sheep which bear it, has of course kept pace.

"The Merino has been variously described. This arises from the fact that it is but the general appellation of a breed, comprising several varieties, presenting essential points of difference in size, form, quality and quantity of wool." And writers of high authority differ even in their descriptions of these families or varieties. M. Lasteyrie, so celebrated as a writer on sheep, and particularly on the Merino, and Mr. Jarvis directly contradict each other on several points.† It is scarcely necessary now to quote their conflicting statements, or inquire which is right—as the questions involved possess no practical importance. These families have, generally, been merged, by interbreeding, in the United States and other countries which have received the race from Spain. Purity of *Merino* blood, and actual excellence in the individual and its ancestors, has long since been the only standard which has guided sensible men in selecting sheep of this breed. Families have indeed sprung up, in this country, ex-

* Archives of Useful Knowledge.—Cultivator, vol. i. p. 183.

† See Lasteyrie on Sheep—or, if not accessible—his statements quoted by Mr. Youatt, p. 156. For Mr. Jarvis's statements, see his Letter to L. D. Gregory, quoted in American Shepherd, pp. 73, 74.

hibiting wider points of difference than did those of Spain. In some cases they doubtless owe it to particular courses of breeding—but more often, probably, to concealed or forgotten infusions of other blood.

The point has, indeed, been occasionally mooted, whether there are any Merinos in the United States, descendants of the early importations, of *unquestionable* purity of blood. That there are, has been recently definitely settled by a connected chain of undisputable and undisputed testimony,* not necessary here to be repeated. That, on the other hand, in the recent rush of speculation, a marvelous facility has been evinced, in some instances, in suddenly recollecting lost links in the chain of pedigree—or in forgetting others which it would not be expedient to remember, no one would require any proof who has seen some of the animals which have been hawked through the country as full-bloods.

"Taken collectively, the Spanish rams, according to Chancellor Livingston, yield about eight and a half pounds of wool, and the ewes five, which loses half in washing—making four pounds and a quarter the average weight of fleece of the rams, and two and a half the average of the ewes.† Some varieties considerably exceed this estimate, and probably it would fall short if applied to the prime sheep of any variety."

The fleeces of the Merinos at Rambouillet in France, it is stated in the Report of M. Gilbert, to the National Institute, quoted by Mr. Livingston,‡ weigh, in the rams, from twelve to thirteen pounds (unwashed) wool—taking rams and ewes together, it has "not quite attained to eight pounds, after deducting the tags and the wool of the belly, which are sold separately." Mr. Livingston remarks that the French pound is about one-twelfth heavier than the English; but on the other hand, that from the manner of folding and housing sheep and feeding them on fallows in France, they are very dirty, and lose 60 per cent. in washing."|| This would bring the average of the Rambouillet flock to about four pounds, exclusive of tag and belly wool.

M. Lasteyrie gives the following annual averages per head of the Rambouillet flock: 1796, 6 lbs. 9 oz.; 1797, 8 lbs.; 1798, 7 lbs.; 1799, 8 lbs.; 1800, 8 lbs.; 1801, 9 lbs. 1 oz.—This is *unwashed* wool, and will lose half in washing. Mr. Livingston's imported ewes averaged 5 lbs. 2 oz.; his rams 6 lbs. 7 oz., of unwashed wool.§ The later importations will, judging from the specimens I have seen, average much higher than the latter. They are a large sheep, with good, but not the best, quality of Merino wool—some of the larger stocks being rather coarse—and not very uniform, one with another, either in their appearance or fleeces—and are most remarkable for the loose pendulous skin which hangs about their necks, and lies in folds about their bodies. They are free from hair—their wool, which is of good style, opens with a creamy color, and rich lustre, on a fine rose-colored skin. Their wool is long on the back, shortish on the belly—thick, but not so thick as that of many of the American Merinos—very yolky, but destitute of concrete external gum.

The American Merino has, as already intimated, diverged into families or varieties presenting wide points of difference. The minor distinctions are numerous, but they may all, perhaps, be classed under three general heads. The *first*, is a large, short-legged, strong, exceedingly hardy sheep, carrying a heavy fleece, ranging from medium to fine—free from hair in properly bred flocks—somewhat inclined to *throatiness*, but not so much so as the Rambouillets—bred to exhibit external concrete gum in some

* This testimony will be found in a Letter from me to A. B. Allen, Esq., in the December No of the American Agriculturist, 1844, and in the Cultivator, I think, of the same date—if not, the succeeding No.
† Livingston's Essay on Sheep, p. 39. ‡ Ibid., p. 49, *et supra.*
|| Livingston's Essay on Sheep, p. 51. § Ibid., Appendix.

flocks, but not commonly so—their wool longish on both back and belly, and exceedingly dense—wool whiter within than the Rambouillets—skin the same rich rose-color. The ram on page 169 is a good specimen of this variety, though his age is not sufficient to give him the substance and compactness of an older animal, and the apparent want in these particulars is hightened by recent shearing.* His first fleece of well-washed wool, at thirteen months old, was 8 lbs.; was of beautiful quality, and entirely destitute of hair. At three years old he would have sheared from 10 to 12 lbs. of well-washed wool.†

MERINO EWE.

The *second* general class of American Merinos are smaller than the preceding—less hardy—wool as a general thing finer—covered with a black pitchy gum on its extremities—fleece about one-fourth lighter than in class first.

The *third* class, which have been bred mostly South, are still smaller and lesss hardy—and carry still finer and lighter fleeces. The fleece is destitute of external gum. The sheep and wool bear a close resemblance to the Saxon; and if not actually mixed with that blood,‡ they have been formed into a similar variety, by a similar course of breeding.

Class *first* are a larger and stronger sheep than those originally imported from Spain, carry much heavier fleeces, and in well selected flocks, or individuals, the fleece is of a decidedly better quality. The ewe from my flock—the portrait of which is given above—sheared 7 lbs. 10 oz. of well-washed wool.‖ The fibre numbered 1. in fig. 1, in the succeeding measurements by Dr. Emmons, is from this fleece. The fleece is exceedingly even and entirely destitute of hair.

For the purpose of exhibiting the comparative quality of the wool of

* The portrait, on the whole, is strikingly accurate, but the skill of the artist does not compensate for his want of experience, in animal painting, in giving the anatomical details and *expression* of the countenance. The same remark applies to the portrait of the ewe.

† This valuable animal died since the above portrait was painted, and prior to his second shearing.

‡ I am not aware what pedigree is claimed for them. They are usually spoken of as Merinos.

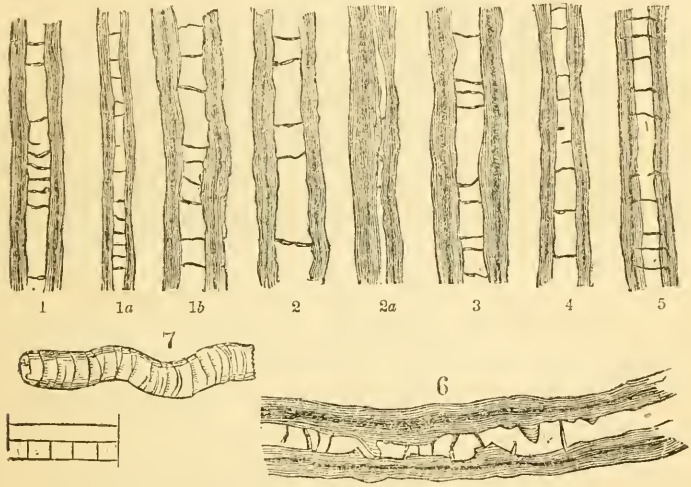
‖ *i. e.*—washed as clean as practicable in a brook, under a heavy sheet of falling water.

the American, Rambouillet, and early imported Spanish Merinos, I copy the following, from the pen of Ebenezer Emmons, M. D., State Geologist, in the American Quarterly Journal of Agriculture and Science, of which publication Dr. E. is the Editor.

"Having given you a pretty full report of the farm and stock of Mr. Randall, embracing many details also in the several branches of husbandry, I now propose adding a few words as an appendix to that report. I gave some intimation, when speaking of the fineness of the wool of Mr. R.'s sheep, that on my return home I would furnish something more exact as a test for fineness than the naked eye. In fulfillment of this intimation, I have been engaged since I returned, in measuring the diameter of the different staples which I procured while at Cortlandville, and which I have compared with others obtained of our mutual friend, Luther Tucker, Esq., of the Cultivator.

"The different kinds are indicated by numbers. I have prepared a scale which is equal to 100 millimeters; a millimeter is equal to 0·039 of an inch. The hundredth of a millimeter,* and the fibres of wool, are all subjected to the same magnifying power of an excellent Chevalier's compound microscope. The comparison is both absolute and relative; but it is highly interesting to see the perceptible difference between the different fibres of wool. The microscope also reveals other differences; some of the fibres appeared rather uneven or flattened, and destitute of a clear and distinct pith or tube; and, in fact, I may remark that the microscope is really the best method of testing the real quality of wool." . . .

Fig. 1.



"No. 1, Mr. Randall's; No. 1*a*, fibre of Mr. Randall's prize Merino buck;† No. 1*b*, fibre from one of Mr. Randall's fleeces; No. 2 and 2*a*, fibres from Mr. Seth Adams's wool; No. 4, Remilles wool, Shoreham, Vt.; No. 5, fibre of S. O. Burchard's fine wool, Shoreham; No. 3, fibre of Charles L. Smith's wool, Shoreham; No. 6, fibre from Collins's Grandee. The last five were taken from wool left at the Cultivator office. In all the fibres examined there is a great uniformity in the parcels; only slight differences, in fact, could be detected in the several diameters. No. 7 shows the structure of wool as seen under the microscope. In the corner is the scale of measurement. The finest fibre as magnified in this cut is equal to about eighteen-hundredths of an inch in diameter.

"Another inquiry equally important with the preceding came up in this place: What is the strength of a single fibre of wool, and is the coarser comparatively stronger than the fine? I set about answering those inquiries at once, and now give you the result below:

"Mr. Randall's No. 1*b*, on three trials, supported on an average 62 grains; or, rather, broke when tried with the weight of 62 grains.

"Mr. R.'s No. 1*a* broke with 57·1 grains.

"The fibre from Collins's Grandee, on three trials, supported on an average 84·6 grains.

"Mr. Smith's specimen of Shoreham, Vt., on three trials, gave an average of 65·6 grains."

No. 1*a* is the wool of my ram "Premium," which received the first prize

* About 1-2500 of an inch.

† Taken from the animal by Doct. Emmons.

at the State Fair at Poughkeepsie, 1844,* and his fleece weighed 10 lbs. of well washed wool.

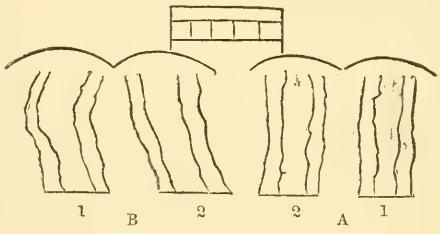
No. 2 and 2*a*, (Mr. Seth Adams's wool,) were from the sheep imported by that gentleman.

No. 6 was from Grandee, the best ram of Mr. Collins's Rambouillet importation.

It will be observed, first, that the American wool is the finest, and second, its strength is greatest in proportion to its diameter.

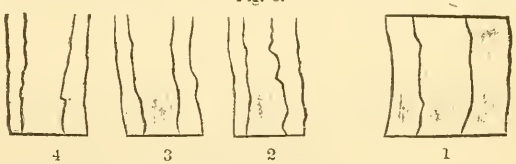
It will probably be as well to bring Doct. Emmons's subsequent measurements of the wool of other individuals and varieties together at this place, as to scatter them through the descriptions of the several breeds. It will render a comparison between them more convenient. I would remark that the cuts are copied from those of Doct. Emmons, with the strictest fidelity.† Indeed they are perfect *fac similes*.

Fig. 2.



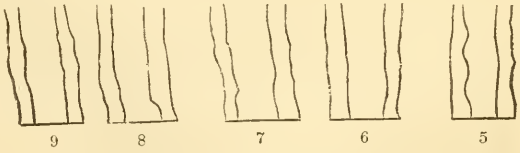
"Figure 2 (scale of measurement same as in Fig. 1) exhibits the comparative diameters of the wool fibre of two premium Saxon sheep exhibited at the State Fair at Utica, 1845. A 1 is a fibre of wool from the shoulder of the 2d premium sheep (Mr. Church's); 2 do. from the flank. B 1, fibre from the shoulder of the first premium sheep (Mr. Crocker's); 2 do. flank.

Fig. 3.



"Fig. 3, No. 1. fibre of Bakewell—about the average fineness of this kind of wool. No. 2, fibre from Merino ewe belonging to Col. Sherwood, 3 years old (Blakesley sheep.) No. 3 do. Mr. Bailey's ewe. No. 4 do. Mr. Atwood's.

Fig. 4.



"Fig. 4.—No. 5, fibre of Mr. Ellis's ewe, fleece weighing 6 lbs. 13 oz. No. 6 do. Mr. Nettleton's yearling Merino buck. No. 7 do. a sample from the imported 5 per cent. South American wool, which is seen to be nearly as fine as the best of our flocks. No. 8 do. Col.

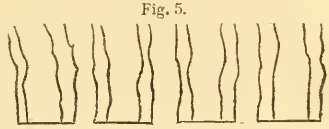
* This is the only time my sheep have ever been shown at a State Fair, and I first made arrangements for exhibiting, in the expectation of having the privilege of comparing my sheep with the imported Rambouillets of Mr. Collins. Mr. C., however, declined my invitation to show. I received the first prize on rams, and the first and second on ewes.

† Executed by William Howland, of New-York, whom I take pleasure in recommending to all wishing to obtain wood engravings, as an accurate and most obliging artist.

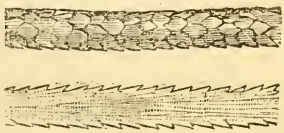
Sherwood's three-year-old buck, sheared 8½ lbs. of wool. No. 9 do. finest Saxon wool in market.

Fig. 5.—No. 10, fine Ohio wool. No. 12, do. Saxon of the late Mr. Grove's excellent flock. No. 13, do. original imported Spanish wool by Seth Adams. No. 14, Mr. L. A. Morrell's Saxon.

Fig. 5.



The following cut, copied from Youatt, exhibits a fibre of Merino wool viewed both as an opaque and transparent object, with a microscope manufactured by Mr. Powell, of London.



The serrations or "beards," which constitute the felting property of wool, are beautifully distinct and sharp. It was a picklock from a Negretti fleece, and Mr. Youatt says it is "very fine, being only the $\frac{1}{750}$th part of an inch in diameter." By consulting Doct. Emmons's preceding statements, it will be seen that the wool of my prize ram "Premium" is only about $\frac{1}{1800}$th of an inch in diameter! This forcibly shows the improvement which has been made on the Merino wool of Spain in the United States.

"The Merino, though the native of a warm climate, becomes readily inured to the greatest extremes of cold, flourishing as far north as Sweden, without degenerating in fleece or form. It is a patient, docile animal, bearing much confinement without injury to health, and possesses none of that peculiar 'voraciousness of appetite,' ascribed to it by English writers.*—Accurately conducted experiments have shown that it consumes" a little over "two pounds of hay per diem, in winter; the Leicester consumes from three and a half to four; and the common wooled American sheep would not probably fall short of three. The mutton of the Merino, in spite of the prejudice which exists on the subject, is short grained and of good flavor, when killed at a proper age," and weighs from ten to fourteen pounds to to the quarter. "It is remarkable for its longevity, retaining its teeth and continuing to breed two or three years longer than the common sheep," and at least half a dozen years longer than the improved English Breeds; "but it should be remarked in connection with this fact, that it is correspondingly slow in arriving at maturity. It does not attain its full growth before three years old, and the ewes in the best managed flocks, are rarely permitted to breed before they reach that age."

The Merino is a far better breeder than any other fine-wooled sheep, and my experience goes to show that its lambs, when newly dropped, are hardier than the Bakewell, and equally so with the high bred South-Down. The ewe is not so good a nurse, however, as the latter, and will not usually do full justice to more than one lamb. Eighty or ninety per cent. is about the ordinary number of lambs usually reared, though it often reaches one hundred per cent. in carefully managed or small flocks.

"We have already adverted to the cross between the Merino and the native sheep. On the introduction of the Saxon family of the Merinos, they were universally engrafted on the parent stock, and the cross was continued until the Spanish blood was nearly bred out." When the admixture took place with judiciously selected Saxons, it resulted not unfavorably for certain purposes. But unfortunately these instances of judicious crossing were rare. Our country was flooded by eager speculators, with the feeblest and least hardy Merinos of Germany. Fineness of wool during

*Youatt, p. 119.

the period of this strange excitement, was made the only test of excellence, no matter how scanty its quantity, no matter how diminutive or miserable the carcass. Governed by such views, the holders of most of our Merino flocks purchased these over-delicate Saxons, and the consequence was as might have been foreseen—their flocks were ruined."

SAXON RAM

Saxons.—"In the year 1765, Augustus Frederick, Elector of Saxony, obtained permission from the Spanish Court to import two hundred Merinos, selected from the choicest flocks of Spain. They were chosen principally from the Escurial flock, and on their arrival in Saxony, were placed on a private estate belonging to the Elector, under the care of Spanish shepherds. So much importance was attached to the experiment, as it was then considered, that a commission was appointed to superintend the affairs of the establishment; and it was made its duty to diffuse information in relation to the management of the new breed; to dispose of the surplus rams at prices which would place them within the reach of all holders of sheep; and finally, by explaining the superior value of the Merinos, to induce the Saxon farmers to cross them with their native breeds. Popular prejudice, however, was strong against them, and this was hightened by the ravages of the scab, which had been introduced with them from Spain, and which proved very destructive before it was finally eradicated. But when it became apparent that the Merino, so far from degenerating, had improved" in the quality of its wool, in Saxony, "the wise and patriotic efforts of the Elector began to reap their merited success, and a revolution took place in popular sentiment. The call for rams became so great that the Government resolved on a new importation, to enable them more effectually to meet it, and to improve still farther the stock already obtained. For this purpose an individual, considered one of the best judges of sheep in Saxony, was dispatched to Spain in 1777, with orders to select three hundred. For some reason, probably because he experienced difficulty in obtaining a greater number presenting all the qualifications he sought, he return-

ed with but one hundred and ten. They were from nearly all the different flocks of Spain, but principally the Escurial—and were considered decidedly superior to the first importation. In addition to the establishment at Stolpen, already founded, others were now commenced at Rennersdorf, Lohmen, &c.; schools were established for the education of shepherds; publications were distributed by the commissioners to throw information on the subject before the people; and the Crown tenants, it is said, were each required to purchase a certain number of the sheep."

Mr. Spooner* states that there are two distinct breeds of the Saxon Merino sheep, the first "having stouter legs, stouter bodies, head and neck comparatively short and broad, body round. The wool grows most on the face and legs—the grease in the wool is almost pitchy." The other breed called Escurial have longer legs, with a long, spare neck and head, with very little wool on the latter, and a finer, shorter and softer character in its fleece, but less in quantity. The fleece in the Escurial averages from one and a half to two pounds in ewes, and two to three pounds in rams and wethers, while in the others it is from two and a quarter to three and a quarter in ewes, and from four to six pounds in ram and wethers. These varieties cannot be amalgamated successfully.

The preceding portrait is a favorable specimen of the Escurial Saxon, copied from a cut, after a drawing by Harvey, in Mr. Spooner's work.

That the German shepherds have sacrificed the hardiness of the Merino, and indeed almost everything else, for fineness of staple, there can be but little doubt. Their method of managing the sheep and its effects are thus described by Mr. Carr, a large sheep-owner of Germany:†

"They are always housed at night, even in summer, except in the very finest weather, when they are sometimes folded in the distant fallows, but never taken to pasture until the dew is off the grass. In the winter they are kept within doors altogether, and are fed with a small quantity of sound hay, and every variety of straw, which has not suffered from wet, and which is varied at each feed; they pick it over carefully, eating the finer parts, and any grain that may have been left by the threshers. Abundance of good water to drink, and rock-salt in their cribs, are indispensables. . . . . They cannot thrive in a damp climate, and it is quite necessary that they should have a wide range of dry and hilly pasture of short and not over-nutritious herbage. If allowed to feed on swampy or marshy ground, even once or twice, in autumn, they are sure to die of liver-complaint in the following spring. If they are permitted to eat wet grass, or exposed frequently to rain, they disappear by hundreds with consumption. In these countries it is found the higher bred the sheep is, especially the Escurial, the more tender!"

Such are the common views of the sheep, and their treatment over Germany, Prussia, and Austria. Various statements of the methods adopted by Baron Geisler, Graf Hunyadi, and other eminent flockmasters, will be found in Dr. Bright's Travels in Lower Hungary, Paget's Travels in Hungary and Transylvania, Jacob's Travels in Germany, &c.

The qualities of the Saxons as breeders and nurses, may be inferred from the following regulations, for the management of his flock, by Baron Geisler.‡

"During the lambing period, a shepherd should be constantly day and night in the cote, in order that he may place the lamb, a soon as it is cleaned, together with its mother, in a separate pen, which has been before prepared. The ewes which have lambed should, during a week, be driven neither to water or pasture; but low troughs of water for this purpose are to be introduced into each partition, in order that they may easily and at all times quench their thirst. It is also very useful to put a small quantity of barley-meal into the water, for by this means the quantity of the ewe's milk is much increased. When the lambs are so strong that they can eat, they are to be separated by degrees from their mothers, and fed with the best and finest oats, being suffered at first to go to them but three times a day, early in the morning, at mid-day, and in the evening, and so to continue till they can travel to pasture, and fully satisfy themselves."

* Spooner, p. 57. † Quoted by Spooner, p. 58. ‡ Ibid., p. 59.

The following history of the introduction of the Saxons into the United States, was compiled by me from written memoranda, and the oral statements of Mr. Grove, submitted to the Committee of New-York State Agricultural Society, already alluded to, of which I was Chairman, and was published in my Report, credited, of course, to Mr. Grove individually, as no other member of the Committee was conversant with the facts narrated.*

"The first importation of Saxony sheep into the United States was made by Mr. Samuel Henshaw, a merchant of Boston, at the instance of Col. James Shepherd, of Northampton. They were but six or seven in number. In 1824, Messrs. G. & T. Searle, of Boston, imported 77 Saxon sheep. They were selected and purchased by a Mr. Kretchman, a correspondent of the above firm, residing in Leipsic, and shipped at Bremen on board the American schooner Velocity. I was engaged to take charge of the sheep on the passage, and I also shipped six on my own account. I am sorry to say that as many as one-third of the sheep purchased by Kretchman, (who shared profit and loss in the undertaking,) were not pure-blooded sheep. The cargo were sold at auction at Brooklyn, as 'pure-blooded electoral Saxons,' and thus unfortunately in the very outset the pure and impure became irrevocably mixed. But I feel the greatest certainty that the Messrs. Searle intended to import none but the pure stock—the fault lay with Kretchman. In the fall of 1824, I entered into an arrangement with the Messrs. Searle to return to Saxony, and purchase in connection with Kretchman, from 160 to 200 Electoral sheep. I was detained at sea seven weeks, which gave rise to the belief that I was shipwrecked and lost. When I finally arrived, the sheep had been already bought by Kretchman. On being informed of what the purchase consisted, I protested against taking them to America, and insisted on a better selection, but to no purpose. A quarrel ensued between us, and Kretchman even went so far as to engage another to take charge of the sheep on their passage. My friends interposing, I was finally induced to take charge of them. The number shipped was 167, 15 of which perished on the passage. They were sold at Brighton, some of them going as high as from $400 to $450. A portion of this importation consisted of grade sheep, which sold as high as the pure-bloods, for the American purchasers could not know the difference. It may be readily imagined what an inducement the Brighton sale held out to speculation, both in this country and Saxony. The German newspapers teemed with advertisements of sheep for sale, headed 'Good for the American Market;' and these sheep, in many instances, were actually bought up for the American market at five, eight or ten dollars a head, when the pure-bloods could not be purchased at from less than $30 to $40. In 1836, Messrs. Searle imported three cargoes, amounting in the aggregate to 513 sheep. They were of about the same character with their prior importations, in the main good, but mixed with some grade sheep. On the same year a cargo of 221 arrived, on German account, Emil Bach, of Leipsic, supercargo. A few were good sheep and of pure blood; but taken as a lot they were miserable. The owners sunk about $3,000. Next came a cargo of 210 on German account; Wasmuss and Multer, owners. The whole cost of these was about $1,125, in Germany. With the exception of a small number, procured to make a flourish on, in their advertisements of sale they were sheep having no pretensions to purity of blood. In 1827, the same individuals brought out another cargo. These were selected exclusively from grade flocks of low character. On the same year the Messrs. Searle made their last importation, consisting of 182 sheep. Of these I know little. My friends in Germany wrote me that they were like their other importations, a mixture of pure and impure blooded sheep. It is due, however, to the Messrs. Seale to say that, as a whole, their importations were much better than any other made into Boston.

"I will now turn your attention to the importations made into other ports. In 1825, 13 Saxons arrived in Portsmouth. They were miserable creatures. In 1826, 191 sheep arrived in New-York, per brig William, on German account. A portion of these were well descended and valuable animals, the rest were grade sheep. In June the same year, the brig Louisa brought out 173 on German account. Not more than one-third of them had the least pretensions to purity of blood. Next we find 153, shipped at Bremen, on German account.—Some were diseased before they left Bremen, and I am happy to state that twenty-two died before their arrival in New-York. All I intend to say of them is, that they were a most curious and motley mess of wretched animals. The next cargo imported arrived in the brig Maria Elizabeth, under my own care. They were 165 in number, belonging to myself and F. Gebhard, of New-York. These sheep cost me $65 a head when landed in New-York.—They sold at an average of $50 a head, thus sinking about $2,400! I need not say that they were exclusively of pure blood. A cargo of 81 arrived soon after, but I know nothing of their quality. The next importation consisted of 134, on German account, per brig Warren. With a few exceptions they were pure-blooded and good sheep. We next have an importation of 200 by the Bremen ship Louisa. They were commonly called the 'stop sale sheep.

* Mr. Morrel in his American Shepherd, quotes this as a "Report" drawn and read by Mr. Grove, (one is left to infer,) before the New-York State Agricultural Society. This is doubtless an inadvertance.

They were of the most miserable character, some of them being hardly half-grade sheep.—The ship Phebe Ann brought 120 sheep, of which I know little; and 60 were landed at Philadelphia, with the character of which I am unacquainted. Having determined to settle in America, I returned to Saxony, and spent the winter of 1826–7 in visiting and examining many flocks. I selected 115 from the celebrated flock of Machern, embarked on board the ship Albion, and landed in New-York June 27, 1827. In 1823, I received 30 more from the same flock, selected by a friend of mine, an excellent judge of sheep. I first drove them to Shaftsbury, adjoining the town of Hosic, where I now reside. On their arrival they stood me in $70 a head, and the lambs half that sum."

"It will be inferred from the facts above stated that there are few Saxon flocks in the United States that have not been reduced to the quality of grade sheep, by the promiscuous admixture of the pure and the impure which were imported together, and *all* sold to our breeders as pure stock."

And independent of this, there are but exceedingly few flocks which have not been *again* crossed with the Native or Merino sheep of our country, or both. Those who early purchased the Merino, crossed them with the Native; and, when the Saxons arrived, these mongrels were bred to Saxon rams. This is the history of probably three-quarters of the "Saxon" flocks of the United States, and among them some, as *I know*, among the most celebrated.

As these sheep have now so long been bred toward the Saxon that their wool equals that of the pure-bloods, it is exceedingly problematical in my mind whether they are any worse for the admixture: when crossed only with the Merino, it is undoubtedly to their advantage. Though I once thought differently, experience has satisfied me that the American Saxon, with these early crosses in its pedigree, is a hardier and more easily kept animal than the pure Escurial or Electoral Saxon. As with the Merino, climate, feed, and other causes, have doubtless conspired to add to their size and vigor; but, after all, I have not a doubt they usually owe more of it to those early crosses.

The fleeces of the American Saxons weigh, on the average, from 2 or $2\frac{1}{4}$ to 3 lbs. They are, comparatively speaking, a tender sheep, requiring regular supplies of good food, good shelter in winter, and protection in cool weather from storms of all kinds; but they are evidently hardier than the parent German stock. In docility and patience under confinement, late maturity, and longevity, they resemble the Merinos, from which they are descended; though they do not mature so early as the Merino, nor ordinarily live so long. They are poorer nurses; their lambs smaller, feebler, and far more likely to perish, unless sheltered and carefully watched. They do not fatten so well, and, being considerably lighter, they consume an amount of food correspondingly less.

Taken together, the American Saxons bear a much finer wool than the American Merinos; but Dr. Emmons's measurements show that this is not always the case, and many breeders of Saxons are now crossing with the Merino, in the expectation of increasing the weight of their fleeces without deteriorating its quality.* Though I am in possession of wool from Saxons in Connecticut and Ohio, which compares well with the higher grades of German wool,† and though there are doubtless other flocks of equal quality in the country,‡ our Saxon wool, as a whole, falls considerably below that of Germany; and I never have seen a *single lock* of the American equaling some samples, given me by a friend recently

* Mr. Lawrence believes this practicable, and Mr. Morrel and various other Saxon breeders have for some time bred in this way.

† Fully equaling, and, I think, better than some German wool I recently saw, which, all expenses included, stood the purchaser in $1 60 per pound!

‡ Dr. Emmons stated, subsequently to his measurements above, that he had received wool from the flock of Dr. Beekman, considerably finer than the Saxon wool figured.

from Europe, which came from Styria, south of Vienna, in Austria. The inferiority of the American to the German wool is not due to climate or other natural causes, nor is it owing to a want of skill on the part of our breeders. It is owing to the fact that but a very few of our manufacturers have ever felt willing to make that discrimination in prices which would render it profitable to breed those small and delicate animals which produce this exquisite quality of wool. No American breeder thinks of housing his sheep from the *summer* rains and *dew*, or observing any of the *hot-house* regulations—at least in the summer—of Graf Hunyadi, or Baron Geisler! If he did, his wool would not probably pay *half* of its first cost. When our manufacturers wish to find these wools in the *home* market, they must learn to *pay* for them in the *home* market as liberally as they are *compelled* to to obtain them in foreign ones!

THE NEW LEICESTER, OR BAKEWELL.

The portrait above is copied from one of a sheep of this variety, belonging to the Duke of Bedford, given in Mr. Youatt's work on Sheep.

"The unimproved Leicester was a 'large, heavy, coarse-wooled breed' of sheep, inhabiting the midland counties of England. It is described also as having been 'a slow feeder, and its flesh coarse-grained, and with little flavor.' The breeders of that period regarded only size and weight of fleece. The celebrated Mr. Bakewell, of Dishley, was the first who adopted a system more in accordance with the true principles of breeding. He selected from the flocks about him those sheep 'whose shape possessed the peculiarities which he considered would produce the largest proportion of valuable meat, and offal,' and having observed that animals of medium size possess a greater aptitude to take on flesh, and consume less food than those which are larger, and that prime fattening qualities are rarely found in sheep carrying a great weight of wool, he gave the preference to those of smaller size, and was satisfied with lighter fleeces." To reach the wonderful results obtained by Mr. Bakewell, it was supposed that he resorted to a cross with some other varieties, but it is believed by some that he owed his success only to a judicious principle of selection, and a steady adherence to certain principles of breeding.

It is exceedingly unfortunate that this eminent breeder has left us so much in the dark in relation to those principles of breeding, adopted by him, which led to such signal success in his efforts to improve both the cattle and sheep of the region in England in which he resided. All of his measures were veiled in impenetrable secrecy even from his most intimate friends, and he died without voluntarily throwing the least light on the subject. The whole inception and management of his famous "Dishley Society"* betrays selfishness the most intense, and, in plain English, *meanness* the most unalloyed. Should a man claiming to be a gentleman, in *this* country, make valuable discoveries in breeding, or in any other department of husbandry, and closely conceal them from the public, his conduct would meet with universal reprehension and contempt;† yet the thing seems to be considered a matter of course, or is at least passed over without censure, in Youatt, Spooner, Bischoff, and a host of earlier writers, all of whom laud Mr. Bakewell to the echo!

"The improved Leicester is of large size, but somewhat smaller than the original stock, and in this respect falls considerably below the coarser varieties of Cotswold, Lincoln, &c. Where there is a sufficiency of feed, the New Leicester is unrivaled for its fattening properties, but it will not bear hard stocking, nor must it be compelled to travel far in search of its food. It is, in fact, properly and exclusively a lowland sheep. In its appropriate situation, on the luxuriant herbage of the highly cultivated lands of England, it possesses unrivaled earliness of maturity; and its mutton, when not too fat, is of a good quality, but is usually coarse, and comparatively deficient in flavor, owing to that unnatural state of fatness which it so readily assumes, and which the breeder, to gain weight, so generally feeds for. The wethers, having reached their second year, are turned off in the succeeding February or March, and weigh at that age from thirty to thirty-five pounds to the quarter. The wool of the New Leicester is long—averaging, after the first shearing, about six inches; and the fleece of the American animal weighs about six pounds. It is of coarse quality, and little used in the manufacture of cloths, on account of its length, and that deficiency of felting properties common, in a greater or less extent, to all the English breeds. As a combing wool, however, it stands first, and is used in the manufacture of the finest worsteds, &c.

"The high bred Leicesters of Mr. Bakewell's stock became shy breeders and poor nurses, but crosses subsequently adopted" have, to some extent, obviated these defects. So far as my experience has extended in this country, however, the lambs are not very hardy, and require considerable attention at the time of yeaning, particularly if the weather is even moderately cold or stormy. Neither can the grown sheep be considered, in my opinion, *very* hardy. They are much affected by sudden changes in the weather, and a sudden change to cold is pretty sure to be registered on their noses by unmistakable indications of catarrh or 'snuffles.'

"In England, where mutton is generally eaten by the laboring classes, the meat of this variety is in very great demand; and the consequent return which a sheep possessing such fine feeding qualities is enabled to make, renders it a general favorite with the breeder. Instances are recorded of the most extraordinary prices having been paid for these ani-

* For the Regulations of this Society, see Youatt, p. 317.

† Of course I do not include in this category those nameless venders of recipes for killing Canada Thistles, rats, &c. &c.; and men who spend their time and property in inventing improved implements, etc., are entitled to the pay offered by the Patent laws. But, among our agriculturists of standing, who has ever known of a single instance of a valuable discovery in the operations of husbandry being concealed or withheld from the public? Who has known a breeder of rank wheedle a partner out of one-half of a valuable bull, and then refuse the quondam partner the services of that bull at any price, lest he should prove a dangerous rival in breeding? Yet, what English writer has expressed any contempt for such meanness? These things would not "go down" among us "*repudiators*"!

mals, and Mr. Bakewell's celebrated buck "Two Pounder" was let for the enormous price of four hundred guineas for a single season! The New Leicester has spread into all parts of the British Dominions, and been imported into the other countries of Europe and the United States. They were first introduced into our own country by the late Christopher Dunn, Esq., of Albany, about twenty-five years since.* Subsequent importations have been made by Mr. Powel, of Philadelphia, and various other gentlemen."

It is no more than justice to say that this breed has never proved a favorite with any large class of American farmers. Our long, cold winters, but more especially our dry, scorching summers, when it is often difficult to obtain the rich, green, tender feed in which the Leicester delights—the general want of green feed in the winter, robs it of its early maturity, and even of the ultimate size which it attains in England. Its mutton is too fat, and the fat and lean are too little intermixed, to suit American taste. Its wool is not very salable, from the much to be regretted dearth of worsted manufactories in our country. Its early decay and loss of wool constitute an objection to it, in a country where it is often so difficult to advantageously turn off sheep, particularly ewes. But, notwithstanding all these disadvantages, on rich lowland farms, in the vicinities of considerable markets, it will always probably make a profitable return.

The following description of what constitutes the desirable characteristics of this breed, is from the pen of Mr. Youatt:†

"The head should be hornless, long, small, tapering toward the muzzle, and projecting horizontally forward. The eyes prominent, but with a quiet expression. The ears thin, rather long, and directed backward. The neck full and broad at its base, where it proceeds from the chest, so that there is, with the slightest possible deviation, one continued horizontal line from the rump to the poll. The breast broad and full; the shoulders also broad and round, and no uneven or angular formation where the shoulders join either the neck or the back—particularly no rising of the withers, or hollow behind the situation of these bones.—The arm fleshy through its whole extent, and even down to the knee. The bones of the leg small, standing wide apart; no looseness of skin about them, and comparatively bare of wool. The chest and barrel at once deep and round; the ribs forming a considerable arch from the spine, so as in some cases, and especially when the animal is in good condition, to make the apparent width of the chest even greater than the depth. The barrel ribbed well home; no irregularity of line on the back or belly, but on the sides; the carcass very gradually diminishing in width toward the rump. The quarters long and full, and, as with the fore legs, the muscles extending down to the hock; the thighs also wide and full. The legs of a moderate length; the pelt also moderately thin, but soft and elastic, and covered with a good quantity of white wool—not so long as in some breeds, but considerably finer."

The South-Down.—"This breed of sheep has existed for several centuries in England, on a range of chalky hills called the South Downs. They were, as recently as 1776, small in size, and of a form not superior to the common wooled sheep of the United States. Since that period, a course of judicious breeding, pursued by one man (Mr. Ellman, of Glynde, in Sussex), has mainly contributed to raise this variety to its present high degree of perfection, and that, too, without the admixture of the slightest degree of foreign blood. In our remarks on this breed of sheep, it will be understood that we speak of the pure improved family, as the original stock, presenting, with trifling modifications, the same characteristics which they exhibited sixty years since, are yet to be found in England—and as the middle space is occupied by a variety of grades, rising or falling in value, as they approximate to or recede from the improved blood.

"The South-Down is an upland sheep, of medium size, and its wool, which in point of length belongs to the middle class," has been estimated to rank with half-blood Merino, and was so estimated in my Report, quo-

* Now about 35 years since.

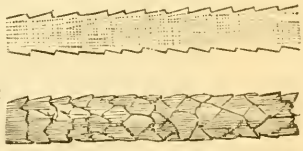
† Youatt on Sheep, p. 110.

tations from which constitute so large a portion of this Letter. But both subsequent experience, and information derived from other sources, have convinced me of the erroneousness of this opinion. South-Down wool is

SOUTH-DOWN RAM.

essentially different from Merino wool of any grade, though the fibre in some of the finest fleeces may be of the same apparent fineness with half or one-quarter blood Merino.

The following cut from Youatt,* gives the microscopic appearance, says that gentleman, of a "prime specimen of picklock South-Down wool," 1 being viewed as a transparent, and 2 as an opaque object." The fibre is $\frac{1}{600}$th part of an inch in diameter.



The cups or leaves of 2 "are roughened irregular, and some of the leaves have exceedingly short angles," but they are far sharper, more numerous and regular (the points which give wool its felting property) than in ordinary South-Down wool. In the latter, the cups are rounded and have a "rhomboidal" instead of that sharp and "hooked" character which distinguishes the Merino and Saxon.

South-Down wool is deficient in felting properties. It makes a "furzy, hairy" cloth, and is no longer used in England, unless largely admixed with foreign wool, even for the lowest class of cloths.

The following testimony was given by some of the most eminent manufacturers, wool-factors, staplers, and merchants of England, before the Committee of the House of Lords in 1828, several times previously alluded to:†

* Youatt, p. 236.

† See Bischoff, vol. ii. pp. 145 to 155.

Mr. CHARLES BULL, wool agent, Lewes.—"Formerly it [South-Down wool] was used for clothing purposes; now it is impossible to sell it for that manufacture; . . . . it is used for baizes and flannels in a very large way."

Mr. WILLIAM CUNNINGTON, wool-stapler, Wiltshire.—"The public will not wear the South-Down cloths, they are so very coarse."

Mr. JAMES FISON, wool dealer, Thetford.—"There has been deterioration in the quality of (South-Down) wool; the general weight of the fleece 20 years ago was 2 pounds to 2¼, and it is now 3 pounds to 3½, our wool used to be made into cloths, and returned into Norfolk, and used by myself and the agriculturists. We do not get the same cloth now; neither myself nor the farmer would wear it, because of the deterioration of quality."

Mr. JAMES HUBBARD, wool agent, Leeds.—South-Down wool is not "now employed for the purpose of making cloth; it has been forced down two or three steps in the scale of wool, and is now used for flannels and baize. . . . . The wool gets more frothy and open, and in manufacturing it does not felt and improve so well; it works more flannely." . . . .

Mr. JOHN BROOKE, manufacturer, Howley.—"Manufacture principally blue cloths from 7s. to 24s. and 25s. per yard, and also narrow cloths. . . . . Had the Duke of Norfolk's wool, Mr. Ellman, junior's, clip from 1817 and 1822, and Mr. Ellman, senior's, from 1817 to 1821. . . . . Kept to English wool longer than any house in the neighborhood. . . . . Ceased to manufacture it entirely in 1823 or 1824, ... found our neighbors were sending out better cloths than we were, not only at the same price, but better manufactured cloths, and we lost our customers."

Mr. BENJAMIN GOTT, merchant and manufacturer, Leeds.—"I formerly used 150 packs of English wool weekly; the disuse of English wool was gradual, commencing about the year 1819, continuing to 1823 and 1824, about which time I began to manufacture exclusively from foreign wool. The disuse of English wool arose from the quality and the advantage of using foreign wool compared with our own. I could not now make an article which would be merchantable at all for the foreign market, (that remark applies equally to the home trade,) in certain descriptions of cloth, except of foreign wool." . . . These wools (the domestic and foreign,) "have different properties."

Mr. WILLIAM IRELAND, Blackwell Hall factor, London.—"We have been using English wool for second and livery cloths, but recently they have been so very much lowered in quality we have not been able to make use of them at all, and have been obliged to make use of low German and low Spanish wools for that purpose."

Mr. J. SUTCLIFFE, wool-stapler, Huddersfield.—"South-Down wool was formerly applied for making cloth for home consumption regularly, for the clothing of servants, &c. It was also used for army clothing. It is now no longer used for those purposes. It makes a furzy, soft, hairy piece; it has not that fastness in it that foreign wool has."

Many other individuals testify to the same effect, and the extremely low character of South-Down wool for carding purposes may be regarded as definitely settled. But as it has deteriorated it has increased in length of staple in England, and to such an extent that improved machinery enables it to be used as a combing wool—for the manufacture of worsteds. Where this has taken place it is quite as profitable, in England, as when it was finer and shorter. In the United States, where the demand for combing-wool is so small that it is easily met by a better article, perhaps thi would not be the case. And it may be problematical whether the proper combing length will be easily reached, or at least maintained in this country, in the absence of that high feeding system which has undoubtedly given the wool its increased length in England.*

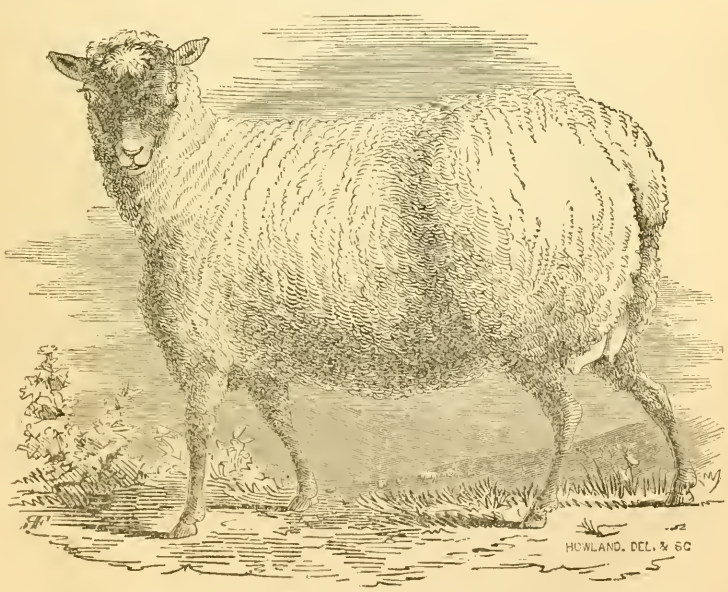
The average weight of fleece in the hill-fed sheep is 3 lbs.; on rich lowlands a little more. Mr. John Ellman, Jr., testified before the Committee of the House of Lords that he was then "keeping his sheep better than formerly—fattening them, which rendered the fleece heavier—that they then averaged about 3 lbs. of wool."† "But the Down is cultivated more particularly for its mutton, which for quality takes precedence of all other" (from sheep of good size) "in the English markets. Its early maturity and extreme aptitude to lay on flesh, render it peculiarly valuable for this purpose. The Down is turned off at two years old, and its weight at that age is, in England, from 80 to 100 lbs. High fed wethers have reached

* Nearly or quite every individual who testifies to the deterioration and increased length of the South-Down wool before the Lord's Committee, assign this as the cause of the change.

† Bischoff, vol. ii., p. 137.

from 32 to even 40 lbs. a quarter! Notwithstanding its weight, the Down has, in the language of Mr. Youatt, a patience of occasional short keep, and an endurance of hard stocking, equal to any other sheep. This gives it a decided advantage over the bulkier Leicester, Lincolns, &c., as a mutton sheep, in hilly districts and those producing short and scanty herbage. It is hardy and healthy, though in common with the other English varieties much subject to the catarrh or "snuffles," and no sheep better withstands our American winters. The ewes are prolific breeders and good nursers. The Down is quiet and docile in its habits, and though an industrious feeder, exhibiting little disposition to rove." Like the Leicester, it is comparatively a short-lived animal, and the fleece continues to decrease in weight after it reaches maturity. It crosses better with short and middle wooled breeds than the Leicester. "A sheep possessing such qualities must of course be valuable in upland districts in the vicinity of markets. They have been introduced into every part of the British Dominions, and imported into various other countries. The Emperor of Russia paid Mr. Ellman three hundred guineas for two rams, and in 1800 'a ram belonging to the Duke of Bedford, was let for one season at eighty guineas, two others at forty guineas each, and four more at twenty-eight guineas each.' These valuable sheep were introduced into the United States a few years since by Col. J. H. Powell, of Philadelphia, and a small number was imported by one of the members of this Committee in 1834. The last were from the flock of Mr. Ellman, at a cost of $60 a head. Several other importations have since taken place."

The ram and ewe, the portraits of which are given, are the descendants of the importation of Francis Rotch, Esq., alluded to in the preceding paragraph. They are most spirited likenesses, and were kindly furnished me by that gentleman, to accompany this Letter. They are exceedingly



SOUTH-DOWN EWE.

characteristic of the Ellman stock. Not so large as the later importations of Mr. Rotch from the celebrated flock of Mr. Webb, they are, in the

opinion of that gentleman, as well as in my own, a more beautifully formed and not less profitable animal. For compactness—great weight in a small compass—they are perhaps unrivaled.

The following is the description of the perfect South-Down by Mr. Ellman, the founder of the improved breed:

"The head small and hornless; the face speckled or gray and neither too long nor too short; the lips thin, and the space between the nose and the eyes narrow; the under jaw or chap fine and thin; the ears tolerably wide and well covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defence against the fly.

"The eye full and bright but not prominent. The orbits of the eye, the eye-cap or bone not too projecting, that it may not form a fatal obstacle in lambing.

"The neck of a medium length, thin toward the head, but enlarging toward the shoulders, where it should be broad and high and straight in its whole course above and below. The breast should be wide, deep, and projecting forward between the fore-legs, indicating a good constitution and a disposition to thrive. Corresponding with this, the shoulders should be on a level with the back, and not too wide above: they should bow outward from the top to the breast, indicating a springing rib beneath, and leaving room for it.

"The ribs coming out horizontally from the spine, and extending far backward, and the last rib projecting more than others, the back flat from the shoulders to the setting on of the tail; the loin broad and flat; the rump broad and the tail set on high, and nearly on a level with the spine. The hips wide; the space between them and the last rib on either side as narrow as possible, and the ribs generally presenting a circular form like a barrel.

"The belly as straight as the back.

"The legs neither too long nor too short; the fore-legs straight from the breast to the foot; not bending inward at the knee, and standing far apart both before and behind; the hock having a direction rather outward, and the twist, or the meeting of the thighs behind, being particularly full, the bones fine, yet having no appearance of weakness, and of a speckled or dark color.

The belly well defended with wool, and the wool coming down before and behind to the knee and to the hock; the wool short, close, curled and fine, and free from spiry projecting fibres."

THE COTSWOLD SHEEP.

The above cut is copied from one in Mr. Spooner's work on Sheep—the original drawing being by Harvey.

The Cotswolds, until improved by modern crosses, were a very large,

coarse, long-legged, flat-ribbed variety, light in the fore-quarter—shearing a long, heavy, coarse fleece of wool. They were hardy, prolific breeders and capital nurses. They were deficient in early maturity, and did not possess feeding properties equaling those of the Down or New Leicester. To a cross with the latter variety we owe the modern or improved Cotswold. Having had no personal experience with the breed,* I prefer quoting the descriptions of the later standard English writers, to the task of compilation.

The following is from Spooner:†

"The Cotswold is a large breed of sheep, with a long and abundant fleece, and the ewes are very prolific and good nurses. Formerly they were bred only on the hills, and fatted in the valleys, of the Severn and the Thames; but with the inclosure of the Cotswold Hills and the improvement of their cultivation they have been reared and fatted in the same district. They have been extensively crossed with the Leicester sheep, by which their size and fleece have been somewhat diminished, but their carcasses considerably improved, and their maturity rendered earlier. The wethers are now sometimes fattened at 14 months old, when they weigh from 15 lbs. to 24 lbs. per quarter, and at two years old increase to 20 lbs. or 30 lbs. The wool is strong, mellow, and of good color, though rather coarse, 6 to 8 inches in length, and from 7 lbs. to 8 lbs. per fleece. The superior hardihood of the improved Cotswold over the Leicester, and their adaptation to common treatment, together with the prolific nature of the ewes and their abundance of milk, have rendered them in many places rivals of the New Leicester, and have obtained for them, of late years, more attention to their selection and general treatment, under which management still farther improvement appears very probable. They have also been used in crossing other breeds, and, as before noticed, have been mixed with the Hampshire Downs. It is, indeed, the improved Cotswold that, under the term New, or Improved Oxfordshire Sheep, are so frequently the successful candidates for prizes offered for the best long-wooled sheep at some of the principal agricultural meetings or shows in the Kingdom. The quality of the mutton is considered superior to that of the Leicester, the tallow being less abundant, with a larger development of muscle or flesh. We may, therefore, regard this breed as one of established reputation, and extending itself throughout every district of the Kingdom."

Of the method of crossing between the Cotswolds and Leicester, Mr. Youatt remarks:‡

"The degree to which the cross may be carried must depend upon the nature of the old stock, and on the situation and character of the farm. In exposed situations, and somewhat scanty pasture, the old blood should decidedly prevail. On a more sheltered soil, and on land that will bear closer stocking, a greater use may be made of the Leicester. Another circumstance that will guide the farmer is the object that he principally has in view. If he expects to derive his chief profits from the wool, he will look to the primitive Cotswolds; if he expects to gain more as a grazier, he will use the Leicester ram more freely."

Cotswold sheep of good quality have been imported into the United States by Messrs. Corning & Sotham, of Albany, and are now bred by the latter gentleman. I believe there were several earlier importations—but of their dates or particulars I am not advised.

The Cheviot Sheep.—Sheep of this breed have been imported into my immediate neighborhood, and were subject to my frequent inspection for two or three years. They had the appearance of small Leicesters, but were considerably inferior in correctness of proportions to high-bred animals of that variety. They perhaps more resemble a cross between the Leicester and the old "native" or common breed of the United States. Their fleeces were too coarse to furnish a good carding wool—too short for a good combing one. Mixed with a smaller lot of better wool, their this year's clip sold for 29 cents per pound, while my *heavier* Merino fleeces sold for 42 cents per pound. They attracted no notice, and might at any time have been bought of their owner for the price of common sheep of the same weight. I believe the flock was broken up and sold to butchers and others this spring, after shearing. They were certainly inferior to the description of the breed by Sir John Sinclair, even in 1792, quoted by Mr. Youatt,‖ and

* With every breed previously described, I have had ample personal experience. I have merely seen Cotswold flocks. † *Q. v.*, p. 99. ‡ *Q. v.*, p. 340. ‖ *Q. v.*, pp. 285, 286.

had all the defects attributed to the original stock by Cully.* They might not, however, have been favorable specimens of the breed.

On the steep, storm-lashed Cheviot Hills, in the extreme North of England, this breed first attracted notice for their great hardiness in resisting

CHEVIOT EWE.

cold and feeding on coarse heathery herbage. A cross with the Leicester, pretty generally resorted to, constitutes the improved variety. The characteristics of the Leicester are quite evident in the portrait of the Cheviot Ewe, above, copied from Mr. Youatt.

Professor Low thus speaks of the result of this cross :

"The Cheviot breed amalgamates with the Leicester, and a system of breeding has been extensively introduced for producing the first cross of this descent. The rams employed are of the pure Leicester breed, and the progeny is superior in size, weight of wool, and tendency to fatten, to the native Cheviot. . . . The benefit, however, may be said to end with the first cross, and the progeny of this mixed descent is greatly inferior to the pure Leicester in form and fattening properties, and to the pure Cheviot in hardiness of constitution.

Of the improved Cheviot Mr. Spooner says :

"This breed has greatly extended itself throughout the mountains of Scotland, and in many instances supplanted the Black-faced breed ; but the change, though in many cases advantageous, has in some instances been otherwise, the latter being somewhat hardier, and more capable of subsisting on heathy pasturage. They are, however, a hardy race, well suited for their native pastures, bearing with comparative impunity the storms of winter, and thriving well on poor keep. Though less hardy than the black-faced sheep of Scotland, they are more profitable as respects their feeding, making more flesh on an equal quantity of food, and making it quicker. They have white faces and legs, open countenances, lively eyes, without horns. The ears are large, and somewhat singular, and there is much space between the ears and eyes. The carcass is long; the back straight; the shoulders rather light; the ribs circular; and the quarters good. The legs are small in the bone and covered with wool, as well as the body, with the exception of the face. The Cheviot wether is fit for the butcher at three years old, and averages from 12 lbs. to 18 lbs. per quarter—the mutton being of a good quality, though inferior to the South-Down, and of less flavor than the Black-faced. . . . . The Cheviot, though a mountain breed, is quiet and docile, and easily managed. The wool is *fine*, (?) closely covers the body, assisting much in preserving it

* See Cully on Live Stock, p. 150.

from the effects of wet and cold; the fleece averaging about 3½ lbs. Formerly the wool was extensively employed for making cloths; but having given place to the finer Saxony wools, it has sunk in price, and been confined to combing purposes. It has thus become altogether a secondary consideration." . . .

If Mr. Spooner is not made to say that the wool is "fine" by an omission of qualifying words, or some other misprint, his ideas of *fineness* must be singular indeed! The South-Down wool, rejected for carding purposes, is several shades finer than the Cheviot! The latter is of about the quality of Leicester, the number of serrations about the same, and, says Mr. Youatt, speaking of the microscopic appearance of the wool, "the derivation of the breed (from the Leicester) is well illustrated by the formation of the fibre."

Mr. John Varley, manufacturer, of Stanningley, near Leeds, thus testified before the Lords' Committee:*

"I attribute the low price of Cheviot wool to deterioration; it is deteriorated very much in point of hair; it was formerly the fashion of the day for Cheviot wool to be worn as cloth; it is not the fashion now. It is not fit to make fine cloths, as it was then. . . . . The wool is grown coarser and longer, and only fit to make low coatings and flushings."

This is confirmed by the testimony of other witnesses before the Committee; and Mr. Youatt on the same subject remarks,† "that the wool is inferior to the South-Down."

Broad-tailed Asiatic and African Sheep.—I allude to the Broad-tailed race of sheep, not from any high estimate which I place upon their value, but because they constitute one of the breeds now existing in a state of purity in the United States.

Some "Tunisian Mountain Sheep" were received by Col. Pickering when abroad, and were distributed by him in Pennsylvania.‡ They are highly spoken of by Col. Powell as a cross with the Dishley and South-Down. They have, I believe, long since become extinct.

It was Commodore Porter, I think, who, you informed me, sent home some of the Broad-tailed sheep of Asia, obtained from Smyrna, pure-blooded descendants of which yet exist in South Carolina.‖ I have carefully examined the specimens of wool of the full blood and the grades of this variety forwarded by you. No. 3, taken from the skin of a full-blood, is 8 inches long, pure white, consisting of coarse hairs, uneven in their length and diameter—the same hair of uneven diameter in different parts of it, and the whole intermixed for about 4 inches from the roots, with a fine, downy or cottony wool. No. 2, about 3¾ inches long from the side of a three-fourths blood ram, is much evener in quality, with no hairs as coarse or wool as fine as in No. 3. It contains some jarr, or short, sharp-pointed hairs, and is a dry, and, I should judge, rather unworkable wool, not *well* adapted to either carding or combing. No. 1, from thigh of same animal, is 8 inches long, resembles No. 3, but not so great a distinction between the hair and the wool. No. 4, from a three-fourths blood 4-year-old ewe, is about 2 inches long, contains a few colored hairs, resembles No. 2, but is somewhat coarser. All these samples are destitute of yolk, and apparently come from loose, light, dry, open fleeces. They do not strike me as wools which could be as profitably cultivated as many others, for any objects or under any circumstances.

If the object is mutton instead of wool, it seems to me that a better selection can be made, from some of the English breeds—which intermingle

* Bischoff, vol ii, p. 144. Mr. Youatt quotes the substance of the above, and fully sustains Mr. Varley's views.

† *Q. v.*, p. 285.

‡ See Essay on Various Breeds of Sheep, by Col. John Hare Powell, published in the Memoirs of the Board of Agriculture of the State of New-York, vol. iii., p. 377, (1826.)

‖ In Letter Vth I inadvertently spoke of these as a *large* breed of sheep. They are not above medium size, or rather, may be said to be a smallish race.

their fat and muscle in such a manner as to render both palatable, instead of depositing a greatly disproportioned share of the former in one luscious mass, forming an impediment to breeding, and an unsightly appendage in the eye of the breeder.

All the different varieties of the Broad-tailed and Fat-rumped sheep will be found described in Youatt, and I will not now consume your time with them.

MORE OF THE VALUE OF CORN COBS AND CORN FODDER,

BUT NOT ENOUGH YET.

ROSWELL L. COLT, Esq., Paterson, N. J. CLEVELAND, Ohio, August 2, 1847.

Dear Sir: I have been thinking a great deal on the subject of *Corn Cobs*, since you were here. The question is, Do they, or do they not, contain nutriment? I have come to the conclusion that they do for a certain time, after which, that they do not. Indian corn does not arrive at a state of perfection until fully six months after it has ripened, during which time it is extracting the saccharine from the cob. From harvest time until spring, cattle and swine should be fed upon cob-meal, on account of the nutriment contained in the cob; after that time the addition of the cob only aids in distending the intestines. The largest breeder of cattle in Northern Ohio is Gen. Oviatt, of Richfield, Medina Co. He informed me that when cattle are failing from some unknown cause, and when everything else has failed to bring them up, that feeding them boiled corn cobs, *exclusively*, will renovate them. I do not know at what season of the year he has fed them, but I venture to say it has been during fall or winter. The reasons why I have come to the above conclusions are, 1st, That new corn, or rather corn ground in January, will not produce near the amount of alcohol that it will in June, due allowance being made for the difference in moisture. 2d, Nature has not prepared corn for seed until it will readily fall from the cob; this will not occur until spring. It is usual in the West to leave the corn crop standing out all winter. The ear while growing stands erect; when ripened it turns toward the ground. The husk is a shield from the weather, and the process of perfecting the grain continues. Wheat and other grains are perfected before leaving the field, and shell readily.

A new use has been discovered for my Drier: a prominent brewer in New-York wishes to obtain it for drying malt for making pale ale. As it does not change the color or flavor of substances dried, it must answer a good purpose for malt, as it has proved in drying flour, corn and corn meal.

Should you feel any interest in corn meal, or should you wish a barrel of it for your own use, I would refer you to Messrs. Allen & Whittlesey, commission merchants, New-York, who had a quantity shipped to them from E. H. Leonard, of Elyria. It was dried on one of my patent driers.

Respectfully yours, &c. J. R. STAFFORD.

We will not yet abandon the hope that some of our Agricultural Societies or Institutes, with ample funds at command, will offer liberal inducements to farmers and men of science to investigate the nature and value of this and the cotton and other plants in every light and relation in which they can be considered. We want to know not only the component parts and exact value of the corn cob at different periods, but we wish to know the proportion which the fodder bears to the grain. We wish to know by analysis how much each of the great staples of our country draws from the soil—how much from the atmosphere—and then how much of these elements of nutrition the soil where they are cultivated contains. More especially should all these staple plants, in all their parts, and in all stages of their growth—as well in their natural state as in their ashes—be thoroughly analyzed, by men known to be competent, and to take a conscientious interest in the welfare and honor of American Agri-

culture. It is the bounden duty of public institutions to have these *useful and practical* ends accomplished in return for the liberal support they receive.

Who knows—for who has analyzed—the real value of corn shucks, for instance, as food for cattle? And yet no portion of the immense product of corn fodder, in any shape, has been noticed in the decennial returns of our national wealth. We confess the views and reflections presented in the foregoing letter to be in many respects new to us; and farther investigations in this new line of inquiry would be far more useful than offering again, for the ten thousandth time, inducements to see how much of the grain of corn can be made on an acre—as if the grain constituted the entire value of the plant! So far from that, we heard Governor Sprigg, one of the largest and most accomplished planters of Maryland, say, some days since, that as food for *milch cows* in reference to the quantity and richness of the milk, and especially the latter, he was satisfied that the *shucks* of corn are incomparably preferable to timothy hay. "Give us but light." We want inquiries pushed in new directions. We want new facts to be developed and "fixed," and principles to be deduced from them, on which practical men may rely for practical results. In lieu of momentary excitement, amusement and humbuggery, we want the ascertainment of facts with a view to the establishment of principles as a sure guide for field practice. We want useful knowledge in lieu of "sounding brass" or a "tinkling cymbal." It is generally supposed, for instance, that green fodder is better than the hay obtained from an equal weight of green grass, but the experiments of Boussingault show that this is not the case:

"A heifer was weighed, and fed for ten days on green fodder; each day a quantity equal in weight to that consumed was put aside to dry. The animal was again weighed, and fed for ten days on dry fodder, then weighed again. The experiment was repeated three times, and each time the animal weighed a little more after feeding on dry fodder than after the green. The difference was not enough to prove that the dry food was the more nutritious, although the experiments showed beyond a doubt that it was not inferior in effect to the other. [*Ann. de Chem. et de Phys.* xvii.; *Chemical Gazette.*]

AGRICULTURAL BOTANY.—We have not had time to examine, carefully, a small volume under this title, from the pen and the ripe knowledge of Doctor DARLINGTON; but, with our knowledge of his extensive researches in that department, and of his unambitious desire rather to be useful than to make a noise in the world, and from what we have seen of the work, we have no hesitation in commending it to public patronage, and to adoption *in all our schools* where there is any care to teach what is in after life to be really of value to all who aspire to be *intellectual farmers.* Apprehending, as is obvious, that the work might appear too technical for farmers, the author has endeavored to parry that objection in his Preface, and the fact ought to be kept in view, that his primary and leading object in undertaking it was to induce and to aid our young farmers to familiarize themselves with the *scientific names and botanical characteristics* of those plants in which they have a direct interest. To that end he has used all the means and appliances at his command, to facilitate a knowledge of the plants in question—adding appropriate and familiar observations in reference to the several species. The work, in short, does not profess to *teach Agriculture,* nor to illustrate the *management of plants,* but is merely an attempt—and in our judgment a most laudable, successful and needed one—to promote a more accurate knowledge of their character as objects of Natural History, and thereby enable farmers to discriminate correctly between species, and to treat of them in their discussions understandingly and confidently—a sort of knowledge and power which every father should desire for his son, as anxiously as, if his son were going to be a carpenter, he would wish him to know a *whip* from a *hand-saw*—or if to be a sailor, that he should know *something about navigation*—or is it that boys who are intended *for the country* are yet forever to be put off with any sort of education, as dry cattle are wintered on what nothing else will eat? Truly it would seem so; nor can we get the Press to help us make it otherwise.

☞ The Editor of The Farmers' Library has occasion to ask the indulgence of Correspondents for omissions, real or apparent, during his past summer's absence, chiefly in the mountains of Western Virginia. At the same time he feels himself called upon to acknowledge—but how can he adequately express—his gratitude for the hospitality enjoyed throughout an excursion embracing all the popular watering-places in that delightful region? Every convenience for traveling was offered over the whole route, by proprietors of railroads, steamboats and stages, (with a single exception,) and at every watering-place he was at once not only welcomed as a guest, but most kindly solicited to prolong his stay, and every facility in the way of conveyance and information tendered, to aid him in prosecuting his inquiries into the agricultural condition and economy of the districts in which he was sojourning. Some of his observations, as it is reasonable to apprehend, may not be pleasing to those whose lots are cast in the localities to which they refer—but would not the sacrifice of sincerity and truth be a poor, not to say a treacherous, return for so much courtesy and kindness? While he begs his friends, then, to believe that he returns to his post with a proper sense of what he owes them, that feeling will prompt him to persevere to the end, in a spirit of gratitude and candor, to vindicate and elevate, according to his humble abilities, the agricultural—at once the most important and neglected—interest of the country. J. S. S..

New-York, September 11, 1847. *Ed. Farm. Lib.*

PRICES CURRENT.

[*Corrected, September* 18, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47 .℔ 100 lb.	5 18¾	@	5 25
Pearls, 1st sort, '47	— —	@	6 50
BEESWAX—American Yellow	— 24	@	— 24½
CANDLES—Mould, Tallow..℔ lb	— 12	@	— 13
Sperm	— 30	@	— 38
COTTON—From.....℔ lb.	— 11	@	— 14½
COTTON BAGGING—Kentucky	— 15	@	— 16
CORDAGE—American.....℔ lb.	— 11	@	— 12
DOMESTIC GOODS—Shirtings, ℔ y.	— 5	@	— 11
Sheetings	— 6½	@	— 15
FEATHERS—American, live	— 28	@	— 33
FLAX—American	— 7½	@	— 8
FLOUR & MEAL—Genesee, ℔ bbl.	5 75	@	5 87½
Troy	— —	@	— —
Michigan	5 37½	@	5 62½
Ohio	5 37½	@	5 62½
Ohio, Round Hoop	— —	@	— —
Ohio, via New-Orleans	— —	@	— —
Pennsylvania	— —	@	— —
Brandywine	— —	@	— —
Georgetown	5 87½	@	6 —
Baltimore City Mills	5 87½	@	6 —
Richmond City Mills	— —	@	— —
Richmond Country	5 87½	@	6 —
Alexandria, Petersburg, &c.	5 87½	@	6 —
Rye Flour	4 —	@	— —
Corn Meal, Western and State	2 50	@	3 —
Corn Meal, Jersey and Brandywine	3 25	@	3 50
GRAIN—Wheat, White....℔ bush.	1 15	@	1 20
Wheat, Red and mixed	1 —	@	1 18
Rye, Northern, new and old	— 74	@	— 76
Corn, Jersey and Northern yel.	— 63½	@	— 64
Corn, Southern, yellow	— —	@	— —
Corn, Western, yellow	— 63½	@	— 65
Oats, Northern	— 44	@	— 46
Oats, Jersey	— —	@	— —
HAY—North River in bales, ℔100 lb	— 45	@	— 50
HEMP—American, dew-rotted..ton	140 —	@	150 —
" " water-rotted	200 —	@	250 —
HOPS—1847	— 14	@	— 16
IRON—American Pig, No. 1	32 —	@	35 —
" Common	27 50	@	30 —
LIME—Thomaston.....℔ bbl.	— 80	@	— 83
LUMBER—Boards, N.R., ℔M. ft. clr.	35 —	@	40—
Boards, Eastern Pine	— —	@	— —
Boards, Albany Pine.....℔pce.	— 12	@	— 21
Plank, Georgia Y. Pine. ℔ M. ft...	27 50	@	— —
Staves, White Oak, pipe. ℔ M....	50 —	@	— —
Staves, White Oak, hhd	40 —	@	— —
Staves, White Oak, bbl	30 —	@	— —
Staves, Red Oak, hhd	24 —	@	28 —
Hoops	20 —	@	30 —
Scantling, Eastern	16 25	@	22 50
Scantling, Oak	30 —	@	35 —
Timber, Oak.....℔ cubic foot	— 25	@	— 30
Timber, White Pine	— 18	@	— 25
Timber, Georgia Yellow Pine	— 28	@	— 32
Shingles .....℔ bunch	1 75	@	2 25
Shingles, Cedar, 3 feet, 1st quality.	26 —	@	30 —
Shingles, Cedar, 3 feet, 2d quality.	24 —	@	28 —
Shingles, Cedar, 2 feet, 1st quality.	18 —	@	22 —
Shingles, Cedar, 2 feet, 2d quality.	16 —	@	20 —
Shingles, Cypress, 2 feet	15 —	@	18 —
Shingles, Company	35 —	@	38 —
MUSTARD—American	— —	@	— —
NAILS—Wrought, 6d to 20d...℔ lb.	— 10	@	— 14
Cut, 4d to 40d	— 4½	@	— 4¾
PLASTER PARIS—℔ ton	2 37½	@	2 50
PROVISIONS—Beef, Mess, ℔ bbl...	12 25	@	13 —
Beef, Prime,	8 25	@	8 75
Pork, Mess, Ohio, new	14 12½	@	14 25
Pork, Prime, Ohio, new	11 25	@	— —
Lard, Ohio.....℔ lb.	— 10	@	— 12
Hams, Pickled	— 7	@	— 7¾
Shoulders, Pickled	— 6½	@	— 6¾
Sides, Pickled	— —	@	— —
Beef, Smoked.....℔ lb.	— 10½	@	— —
Butter, Orange County Dairy	— 19	@	— 20
Butter, Western Dairy	— 14	@	— 16
Butter, Grease	— —	@	— —
Cheese, in casks and boxes	— 7	@	— 7½
SEEDS—Clover.....℔ lb.	— 7	@	— 7½
Timothy.....℔ tierce	17 —	@	20 —
Flax, Rough	— —	@	— —
SOAP—New-York.....℔ lb.	— 4	@	— 5½
TALLOW—American Rendered ...	— —	@	— 10
TOBACCO—Virginia.....@ lb.	— 3	@	— 7½
North Carolina	— —	@	— —
Kentucky and Missouri	— 3	@	— 7½
WOOL—Am. Saxony, Fleece..℔ lb.	— 40	@	— 45
American Full Blood Merino	— 35	@	— 38
American ½ and ¾ Merino	— 30	@	— 34
American Native and ¼ Merino...	— 26	@	— 28
Superfine, Pulled Country	— 32	@	— 34

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ADDRESS OF HON. MITCHEL KING.—CULTIVATION OF THE OLIVE.

A YEAR has nearly rolled round since this learned and eloquent Address was delivered before the State Agricultural Society of South Carolina, in the Hall of the House of Representatives, by Hon. MITCHEL KING, and eagerly as we read and much as we admire it, we have not had an opportunity to take of it the favorable notice deserved; neither can we now. We would fain give it entire, but there are hundreds sent, for which room cannot be found; and there is the less necessity for it as these addresses are generally preserved in pamphlet form, and distributed in the local papers and preserved in the annals of societies, before whom they are delivered. It would fill the pages of any periodical less voluminous than this, to record them all.

We have on other occasions remarked on the erroneousness of the impression, that the business and literature of Agriculture) we can hardly yet venture to employ the word Science) are less cultivated and *understood* in the *South* than in the *North or East!* A more erroneous impression could not well be entertained. Not only is there, as we believe, a greater proportionate number of well-read agriculturists in Virginia, South Carolina or Louisiana, than among the same number of landholders east; but their field-work is as well executed on *large* plantations, as in any part of the Union. But, there is not the same economy—the same attention to, and exact amonnt of the out-goings and the in-comings. The Eastern farmer has the prudence to take care of the *pence*, while the Southern planter spends his pounds. We heard a venerable octogenarian judge in Virginia last summer remark, that he had seen in the time of General Washington, (who was himself passionately fond of the chase, and somewhat addicted, as an amateur breeder and racer, to the sports of the turf;) that he had seen as many as four hundred (we think it was four hundred) private coaches on the race-course at Fredericksburg, at one time; several with four horses and *some with six*. But those times have gone by. *Tempora mutantur et nos mutamur cum illis.*

As to the formation of agricultural societies for intellectuat cultivation and advancement of the great art of husbandry, many suppose that it not only originated in the North, but know not that in the South to this day any such manifestation of sensibility to its rights and interests has taken place. Whereas we see in this admirable Address, what was indeed not new to us, that

"The Agricultural Society of South Carolina began in 1784, was organized on the 24th of August, 1785, and Thomas Heyward, Jr., one of the Signers of the Declaration of Independence, and the late venerable Thomas Pinckney, were elected President and Vice-President. Gentlemen of distinction in other States, and among them Mr. Jefferson, then (in 1785,) Minister to France, were elected members. Many of the members have, from time to time, communicated the results of their experience to the publications of the day, but these communications were not then collected into any permanent work. The publications in which they appeared, have most of them passed away, and though they may have added to what may be called the traditional knowledge of the planter, they generally cannot now be found and consulted for more accurate information. The money raised among the members was liberally expended in promoting the improvement of stock, importing new objects of agricultural industry, and endeavoring to introduce a better system of husbandry and new productive staples into the country. But the results of these efforts were not so successful as they certainly deserved to be. The introduction of the tide-swamp culture of rice by Gideon Dupont, about 1733, and the extensive production of cotton as an export, nearly at the same time, were due rather to individual skill and enterprise, than to any public encouragement. But the spirit of inquiry and improvement increased. The establishment of the South Carolina College sustained and fostered this spirit. The light of learning and science, which has shone and shines there with so much lustre, has cheered and illumined—may it ever continue to cheer and illume—every corner of our land. The labors of a Free Press, and the diffusion of periodical literature, have carried information to every fireside. Agricultural Societies have been formed in different parts of the State, and this Society, combining them all in united and continued effort, has, we trust, commenced a career of usefulness that will lead to the most favorable results. The valuable addresses which have been delivered before you, the reports made to you, and the memoirs collected by you and published for general use, and placed within the reach of every planter, will be of lasting benefit. And the State, by the persevering, untiring efforts of gentlemen of this Society, has been induced to direct the Geological and Agricultural Survey, which, in the able hands by which it has been conducted, has already afforded much invaluable information, and, it is earnestly hoped, will be continued until all the objects contemplated by it be fully attained."

The following suggestions are of general interest, and well worthy the attention of all agricultural associations:

New modes of cultivation, of draining, of manuring, are constantly presenting themselves. New agents of fertility are discovered and applied, not only among ourselves, but in different parts of the world. It would be expensive and hazardous for the individual to test by experiments the success of these novelties, and to ascertain how far they may be adapted to our soil and climate. When such matters are brought under the notice of our Society, how easy and how important would it be to appoint special committees of our body to examine each particular subject of inquiry—to experiment upon it, if experiment be necessary, and to report the results to the next meeting of the Society. The expense and attention and skill of one member would thus inure to the benefit of all, not only of the Society, but of the State. The time and talents of each Committee being particularly called to the subject submitted to it, would secure greater care, and stimulate to more accurate observation and fuller details than can be ordinarily expected from solitary and unsolicited inquiry. We have recently had the highest evidence of the accuracy and importance of the information of a new process of manuring, from the skill and experience of a distinguished member of the Society, who has given to a kindred association the results of his intelligent and continued experiments in marling—and has put that information in the most appropriate shape to be communicated to every planter, and preserved for our successors."

Let those who dare stigmatize the most valued and important of all pursuits, and impeach the wisdom of the Creator himself, by insinuating that there is no connection between the cultivation of the earth and the cultivation of the mind; deny, if they can, the truthfulness of what follows:

"Matters of inquiry on subjects connected with Agriculture are absolutely as boundless as the physical history of the earth which we inhabit. Every year is making new discoveries in the diversities of soil—of the elements of which it is composed—of the quantity of the different parts which enter into the composition—of the growth of plants—of what they owe to the air or to the elements of which it is formed—to the light or to its elements—to electricity, and all the agencies in vegetation by which, in the wonderful laboratory of Nature, the grain produces fruit after its kind, and the small seed becomes a great tree."

Or the expediency of the following recommendation. How much more would it be in keeping with the spirit of the age, if societies would promote such research-

es in Natural Chemistry, instead of going on eternally awarding their premiums to things already known.

"There are some departments in Natural History which are too apt to be looked upon with indifference, even by the considerate, and treated with ridicule by the would-be wit, that are yet of the utmost importance to the husbandman. Our cotton fields are exposed to many enemies—at one time a small caterpillar, that in summer changes into a pretty moth—at another time a large kind of caterpillar, called the army-worm, which produces a butterfly—at another time an insect called the cut-worm or the cotton-louse, attack the cotton plant and blast the hopes of the planter. The Hessian fly lays waste the wheat-field; the locust that has been buried in the ground, as it is said for years, issues from its larva, a winged plague, and spreads devastation and ruin in its track. These, and insects like these, are undoubtedly governed in their production and ravages and whole being, by laws which are little understood. If we knew these laws, we might be able effectually to check or even to destroy their production—and thence either greatly lessen or entirely prevent their ravages. The accumulation of facts respecting these several destroyers, brought together and reported at our anniversaries, would furnish materials from which Science might ascertain these laws. It will be for the Society to determine how far they will direct attention to the collection of such facts."

But our purpose now is to detach from Mr. King's Address the following letter, with which it was enriched, from the classical pen of a practical agriculturist, of whom the profession may be proud—J. Hamilton Couper.

Near Darien, Sept. 3, 1846.

My Dear Sir: I beg you to be assured that, in complying with your request to furnish you with any facts within my knowledge and my views generally, on the subject of the cultivation of the olive tree in this country, I feel equal pleasure in promoting a patriotic object, and in being able, in however trifling a degree, to gratify your personal wishes.

Having had my attention called, many years ago, to this subject, by an experiment on a somewhat large scale, which my father made in 1825; and having devoted some attention to the works of European writers on the cultivation of the Olive, and the manufacture of oil from it, I hope that the following extracts from my note-book may save you some trouble in your investigations. I have probably given much that is already familiar to you; but if I have, you must blame yourself for professing that the subject is comparatively new to you.

The first and all-important question which presents itself is, whether our climate is adapted to the olive tree: and to what portion of our territory we may hope to extend its cultivation. The facts which will be presented, are, I think, decisive, that the immediate seaboard of South Carolina and Georgia, the whole of Florida, and the borders of the Gulf of Mexico, are as suitable for the cultivation of the olive as the south of France.

First, as to climate—Arthur Young, in his travels through France, vol. i., page 311, observes, "several other plants, besides the olive, mark this climate, (the olive climate). Thus, at Montelimart, in Dauphiné, besides that tree, you meet with, for the *first time*, the *promegranate*, the Arbor Judæ, the paliurus, *figs*, and the *evergreen oak*."

The orange tree is found to be more tender than the olive, in France and Italy. The same writer says, "the latter plant (the orange), is so tender, that this (Hieres) is supposed to be the only part of France, in which it will thrive in the open air. I went to Hieres to view them, and it was with pain I found them, without exception, so damaged by the frost, in the winter of 1788, as to be cut down, some to the ground, and others to the main stem."

Rosier, in his Cours d' Agriculture, t. 7, p. 253, observes, "Dans le village d' Hierès on est même obligé de couvrir les citrouniers, les cedrats, etc., pendant les rigueurs du froid."*

Mr. Jefferson in his letter of July, 1787, to the Agricultural Society of South Carolina, remarks, "Wherever *the orange will stand at all, experience shows that the olive will stand well*, being a hardier tree."

Simonde mentions, in his work on Tuscan Agriculture, (Tableau de l' Agriculture Toscane, p. 112), that the olive is considered in Italy as hardier than the vine. "L'on a souvent mis en question si l' on ne pourrait pas naturaliser l' olivier dans des climats moins chauds que ceux qui lui servent de limites, et l'on etait encouragé dans cette espérance par l' observation qu'en Italie quoique l' olivier souffre d'un grand froid, il est, cependant *considéré comme plus robuste que la vigne*, et qu'en conséquence on le place à des expositions où celle-ci ne pourrait pas crôitre."† He farther observes that he himself had vines and olives planted together, and that the for-

[* *Translation.*—In the village of Hierès people are compelled to cover the lemon trees, citrons, &c., during the rigors of the cold. *Ed. Farm. Lib.*]

[† *Translation.*—The question has often been raised whether the olive could not be naturalized in climates less warm than those to which it is now limited; and the hope that it might be done has been strengthened by the fact that in Italy the olive, though it suffers a great degree of cold, is *considered more robust than the vine*, and in consequence is placed in exposures where the latter could not grow. *Ed. Farm. Lib.*]

mer suffered most from the cold. This writer also says that the sweet orange does not succeed well in Tuscany, unless it is protected. "Quoique l' orange doux de Portugal croisse quelquefois en plein vent, dans des jardins bien défendus de la bise, cependant il ne réussit bein qu'en espalier, et autant qu'on peut le préserver des grands froids avec des paillassons."* Id. p. 204.

Bosc, in the article Olivier, Nouveau Cours complet d'Agriculture, t. 9, says that the frost acts injuriously at two periods of the year in France: the first, during mid-winter, whenever the thermometer descends lower than ten degrees below zero, (14° of Fahrenheit), then not only the branches but even the trunks perish, and they have to be cut down. This was the case in 1709, and in 1788, when most of the olive trees in France were destroyed to the ground, (see Young's Travels, vol. i. p. 311). The second period is during the spring, when the plant is in vegetation.—This only occasions the loss of one or two crops, by nipping the extreme shoots: but as injury is more frequent from this cause than the former, the effect is nearly the same.—Bosc, who lived sometime in Charleston, attributes the neglect of the cultivation of the olive in Carolina, to this latter cause. "C'est cette cause, ainsi que je m'en suis assuré sur les lieux qui a empêché les plantations d'oliviers tentés en Caroline, aux environs de Charleston, *climat plus chaud qú aucun canton de France, de reussir.*†

These extracts, which are from writers of the highest authority, are interesting, as they show from the growth of the fig, the pomegranate, and the orange, that the climate of the olive region of France is no milder than the maritime districts of South Carolina and Georgia, and the whole of Florida. But the actual growth of the olive tree itself proves this most conclusively, as far as the limited period which has elapsed since the introduction of that plant into this country, admits of a comparison.

I believe that you had some olive trees growing in Charleston for half a century before the fatal spring of 1835. Ramsey mentions the fruit being pickled from trees imported by Henry Laurens.

At Dungeness, on Cumberland Island, Ga., a number of trees bore abundantly for many years before that season.

In 1825, my father imported through a French house in Charleston, two hundred trees from Provence, via the Languedoc Canal and Bordeaux. They were five months on the way, and did not arrive until May: notwithstanding which, a very few only failed to grow. These trees were planted at Cannon's Point, his residence on St. Simon's Island, latitude 31° 20′; and had borne several small crops of olive, when the severe cold of February, 1835, (3° of Fahrenheit), injured them so much that it was necessary to cut them down to the ground. They all threw up shoots from the old stumps; and many of them had now attained to a diameter of nine inches. For the last two years they have produced some fruit; and this year about one-half of the trees are bending under the weight of an abundant crop. About one hundred trees raised from cuttings are also beginning to bear. Is is now twenty-one years since the importation of these trees, and with the exception of the destructive season of 1835, they have never, in the slightest degree, been injured by the cold. The last winter was one of unusual severity—the thermometer having sunk to 19° Fahrenheit; and although the sweet oranges on the same plantation were much injured, some having been cut down to the ground, I could not perceive that a single leaf, among two hundred and fifty olive trees, had been touched by the frost. This experience is certainly very satisfactory, the more particularly as it is certain that the season of 1835 was the coldest known on this coast for at least one hundred years; as is proved by the destruction of orange trees on St. Simon's Island, which had stood since the occupation of that island by General Oglethorpe, and of others of St. Augustine, which dated still farther back.

The effect of one such disastrous year should not discourage the introduction of so valuable a tree. In the South of France they have persevered in its cultivation, although in 1709 and 1788 almost every tree was destroyed to the ground; and they were severely injured in 1740, 1745, 1748, 1755, and 1768.—(Nouveau Cours d Agriculture, t. 9, p. 194.)

With respect to the danger from the frosts of the spring, alluded to by Bosc, it may be observed that very fortunately the olive tree is late in putting out its flowers, and that they rarely appear before the end of April, by which time there is little risk from frosts on this cost. The failure of the crop for one or two years would be the only injury.

It may be doubted whether the olive tree can be cultivated beyond the influence of the sea air, on the coast of Carolina and Georgia, with the varieties at present known. But it may be hoped that this plant will, in time, become acclimated; and that, by pursuing the plan of raising from the seed, which has been found to produce hardier plants, new kinds, adapted to a greater range of climate, may in time be introduced. The gradual extension of the olive, from the southern to the northern shores of the Mediterranean, would encourage this expectation. The southern coasts of Italy and Spain, which are now the great oil markets of the world, were, during the early periods of Roman history, destitute

[* *Translation.*—Though the sweet orange of Portugal sometimes grows in the open ground in gardens where the north wind is kept out, still it succeeds only on espaliers and when it is protected by mats from the extreme cold. *Ed. Farm Lib.*]

[† *Translation.*—It is this cause, as I am convinced, which has prevented the success of the olive plantation attempted in Carolina in the vicinity of Charleston, *a warmer climate than that of any canton of France.* *Ed. Farm. Lib.*]

of the olive. "Sous le règne de Tarquin l'ancien, cet arbre n'existoit point encore en Italie, en Espagne, et en Afrique. Sous le consulat d'Appius Claudius l'huile étoit encore trés rare à Rome; mais du temps de Pline l'olivier déja passé en France et en Espagne,"* *Humboldt, Essai sur le Géographie des Plantes*, t. 4, 1807, p. 26.

The suitableness of the soil of our southern coast to the olive tree admits of no doubt. It thrives in every soil which is not wet. "Toute espèce de terre, pourvu qu'elle ne soit pas marécageuse, convient à l'olivier, cependant comme il donne souvent plus de bois que de fruits dans les terrains fertiles, et que ces terrains sont toujours précieux pour la culture du blé, etc., on le plante plus généralement dans des lieux caillouteux, *sablonneux*, sur les coteaux les plus arides, pourvu qú ils soient exposés au midi ou levant."† (Nouveaux Cours d'Agriculture, t. 9, p. 174).—That the sandy lands of our seaboard are adapted to the olive, needs no other proof than the luxuriant growth of the trees on St. Simon's and Cumberland Islands.

Should the olive become acclimated to the interior of the States of South Carolina and Georgia, it will find, in the open and gravelly soil of the tertiary slope, between the granite ridge and the tide-water, its most congenial soil. "Aptissimum genus terræ est oleis cui glarea subest, si superposita creta sabulo admista est."‡ (Columella de re rustica, lib. 5. cap. 7. Aldus Venetiis, 1514.) And in his Liber de Arboribus, cap. 17, he says, "Olea maxime collibus siccis, et argillosis gaudet, at humidis campis, et pinguibus, lætas frondes sine fructu affert." ‖ §

Admitting the suitableness of the climate and soil of the sea-coast of Georgia and South Carolina, and that portion of the territory of the United States which lies south of latitude 31°, to the cultivation of the olive, the question next presents itself, is the introduction of that tree likely to prove such a source of profit to the agriculturist as to be worthy of his attention? A calm examination of this part of the subject, will probably disappoint those whose standard of profit has been the exaggerated *hopes* of the cotton culture, and who tolerate no delay in reaping the reward of their labor; but it may present a sufficient inducement to devote some time and expense to the subject, to a class of persons less impatient of growing rich, and who believe that the direction of a part of the agricultural labor of the Southern States to new objects, is called for by the excessive production of a few staples, and that the introduction of a plant affording a wholesome and nutritious article of food, and which is important to many valuable manufactures, will add very materially to the wealth, happiness and independence of the country.

The distance at which the olive trees are planted, is regulated by the circumstance whether the ground is to be devoted solely to them, or is to be cultivated at the same time in grain. In the first case they are placed nearer, and in the latter farther apart.

Bosc, in the article quoted above, observes that generally where the soil is fit for cultivation, the trees are placed far apart, in order to grow some other crop in the interval between them; and says that this practice should be approved of, both because the olive being subject to fail in its fruit, the whole revenue from the land is not lost, and because it is benefited by the annual cultivation which the other crops require, and because the greater the distance between the trees the greater their size, and the more abundant and the better the fruit. He adds that the average distance of the trees apart should in rich soils be fixed at 48 feet, and in poor at 36.

Arthur Young mentions that in Languedoc "many fields are planted in rows at 12 yards by 10." (Travels, vol. ii., p. 72.) At Pingean, "In planting, if they mean to crop the land with corn, in the common manner, that is, one year in two, the other fallow, they put 100 trees to 8 seterées of land; but if they intend to have no corn at all, the same number on 4 seterées. (Id. p. 73.) As the seterée is equal to half an acre, this is at the rate of 25 trees to the acre in the former, and 50 in the latter case.

The distance varies much in other localities, but it may be assumed as a safe ground of calculation, that 25 trees may be planted to the acre when the land is cropped, and 50 if devoted exclusively to the olive.

The product of oil varies very much with the size of the trees, the character of the soil, and the fruitfulness of the season.

In France, Young informs us that at *Toulon* "they have great trees, that are known to yield 20 livres to 30 livres a tree (40 lbs. to 60 lbs., or from 5½ to 8¼ gallons of oil) when they give a crop, which is once in two years, and sometimes once in three—small trees yield 3 livres (6 lbs.), 5 livres (10 lbs.)

[* *Translation.*—Under the reign of Tarquin the Elder this tree did not exist in Italy, in Spain, or in Africa. Under the Consulate of Appius Claudius, the oil was still very rare at Rome; but at the time of Pliny, the olive had already passed into France and Spain. *Ed. Farm. Lib.*]

[† *Translation.*—Every species of soil, provided that it is not marshy, is suitable for the olive; but yet, as in fertile land it is often rather productive of wood, and as such land is always precious for the culture of grain, etc., it is more generally planted in stony and sandy places, and on the most arid hills, if only they are exposed to the south or east. *Ed. Farm. Lib.*]

[‡ *Translation.*—That sort of land is best suited to olives which has a gravelly subsoil if there is a mixture of sand in the upper layer of loam. *Ed. Farm. Lib.*]

[‖ *Translation.*—The olive best likes dry and sandy hills; in moist and rich plains it produces abundant foliage without fruit.§ *Ed. Farm. Lib.*]

§ "Sed neque depressa loca, neque ardua, magisque modicos clivos amat."¶—*Id. Re Rustica.*

¶ "Nor hights, nor vales, but gentle hillocks loves."

and 6 livres (12 lbs.) each." In *Languedoc* "olives pay in general 3 livres (6 lbs.) each tree per annum; some 5 livres (10 lbs.)" At *Pingean* "some large and fine trees are known to give 84 lbs. of oil (or 11½ gallons of oil, as the gallon weighs 7½ lbs.); but they reckon in common, that *good* trees give 3 livres (12 lbs.) one with another." In the article *Olive*, in Michaux's North American Sylva, vol. ii., page 196, Mr. Hillhouse says, "the mean produce of a tree may be assumed in France, at 10 lbs. (1⅓ galls.), and in Italy at 15 lbs. (2 galls.); but single trees have been known, in the productive season, to yield 300 lbs. (41 galls.)"

Young states the produce of a field of 200 trees in Tuscany, to have been,

In 1786,	30	*barrels*,	(150 lbs. each,)	or 615	galls. of oil.
1787,	3	..	..	.. 61	..
1788,	8	..	..	.. 164	..
1789,	25	..	..	.. 512	..
	66	*barrels*,	..	1352	gallons,

or an average per annum of 338 gallons, being 1⅔ gallons per tree. (Travels, vol. ii., page 235.)

"On a very bad stony soil, though in the plain, I found it took twenty trees of 25 years' growth, to yield a *barrel* of oil (20½ gallons.) But in a fine soil, and with very old trees, a *barrel* a tree has been known."

From these statements, assuming that the district to which I have conjecturally limited the olive culture, has a climate as favorable for it as that of the South of France, we may place the product of a tree in full bearing, as giving a mean annual yield of one gallon of oil, or 25 *galls. to the acre*, when the land is cultivated at the same time in some other crop; or at 50 *gallons*, if exclusively devoted to the olive. Estimating the oil at the moderate price of 75 cents per gallon, and the value will be, in the former case, $18¾ per acre, and in the latter, $37½. But to the first must be added the value of the corn or other crops cultivated on the same land; and which may be put down at nearly a full crop every second year, as the trees are reckoned in Italy to diminish the grain crop only one-fifth.

It is presumed that the best mode of promoting the general introduction of the olive into this country will be to recommend the mixed cultivation. As the olive only begins to bear about the *tenth* year, and does not arrive at its full production before the 20th to the 30th, few persons would consent to expend so much labor before reaping any return.

But under the mixed system, nearly the full amount of the usual crops is made, and the manuring and cultivating of the grain crops will be sufficient for the olive trees, and the labor of planting the young trees is almost the only extra work they will require until they commence bearing. The only objection which is likely to present itself at present is the necessity of excluding all stock from the fields; but whenever our Agriculture shall become more enlightened, this will be generally done.

The question may be asked by those who have usually regarded olive oil as merely an article of household economy, of very limited use in North America, whether a ready sale of the oil can be depended on? They may believe with the late Abbé Correa, that our countrymen have "bacon stomachs," and that it will be very difficult so far to conquer the obstinacy of established habit as to induce them to substitute pure oil for rancid bacon. If the only use of this oil were for food, it would undoubtedly require time to introduce it into general consumption; but that time will effect it, there can be no doubt, from the intrinsic value of the article. Until then an ample demand for all that can be produced will be found in the annually increasing consumption of this oil in machinery, and in various manufactures, particularly of wool and soap.* Already we import 32,655 gallons, (see Report of the Secretary of the Treasury for 1845,) and as our manufactures are comparatively, as yet, but in their infancy, and our population increasing with undiminished rapidity, there is no danger of the production overtaking the demand. What the demand may become, is shown by the facts that England imported in the year 1830, 2,791,057 gallons of olive oil, valued then at about $2,500,000—an average of 33 cents per gallon (McCulloch's Commercial Dictionary, article *Olive Oil)*; and that France, although the production of that Kingdom was, as early as 1788, estimated at 75,000,000 of francs, or nearly $15,000,000,† (Peuchet Statistique Elémentaire de la France, p. 327,) has yet imported in one year olive oil to the value of nearly 30,000,000 francs, or $6,000,000.

Some idea may be formed of the value of the olive tree as a source of national wealth, from the above statement of its production in France, a country on the northern verge of the olive climate. In countries more favorably situated, it is still more important. The small Kingdom of Naples exports annually about 7,300,000 gallons of olive oil, valued there at $3,400,000. (McCulloch's Commercial Dictionary, article *Naples.)*

But as olive oil enters largely into domestic consumption, particularly among the lower classes, forming a wholesome and nutritious article of food, it has an importance far exceeding its merely commercial value. The ample home production of the necessaries of life is the true foundation of national independence and happiness; and whatever adds to the unstinted enjoyment of physical comfort, it becomes the well wisher of his country to cherish more sedulously than those ar-

* Hereafter, perhaps, when the whale fishery shall be exhausted, for lights.

† Chaptal estimates the quantity of land cultivated in the Olive in France at 43,000 hectanes, or about 106,000 acres, which gives an annual income per acre of nearly $14. (De l'Industrie Française, t. i., p. 207.)

ticles which have a merely money value. It may safely be asserted that the United States owe their great happiness and prosperity more to the cheap abundance of Indian corn, and the consequent full supply of animal food, than to all the staples which figure so largely on the list of foreign exports.

Mr. Jefferson, with equal beauty and patriotism, observes, "If the memory of those persons is held in great respect in South Carolina, who introduced there the culture of rice, *a plant which sows life and death with almost equal hand*,* what obligations would be due to him who should introduce the olive tree, and set the example of its culture! Were the owners of slaves to view it only as a means of bettering their condition, how much would he better that by planting one of these trees for every slave he possessed! Having been myself an eye-witness to the blessings which this tree sheds on the poor, I never had my wishes so kindled for the introduction of any article of new culture into our own country." (Letter to the Agricultural Society, So. Ca.)

If the facts given above are sufficient to prove the importance and practicability of cultivating the olive among us, no impediment is presented by the difficulty of propagating it, as it is readily increased by seed, by cuttings, suckers, portions of the root, or by grafting. The mode of raising by the seed is only resorted to in order to produce new varieties, or as stocks for grafting, as the fruit from seedlings, although yielding an oil of a more delicate and higher flavor, is usually very small. Grafting improves the quality of the fruit, but is not so generally resorted to as propagation by suckers and cuttings. The last is the most practiced. Limbs from an inch to an inch and a half in diameter, are cut into lengths of from 12 to 15 inches. Trenches 5 feet apart and 6 to 8 inches deep being prepared, the cuttings are placed in them, about 18 inches apart, and in an oblique position, so that when the earth is filled in, from one to two inches will remain above the ground. On the exposed end a little gardener's cement should be smeared, to exclude the water; and over the whole some moss or loose sand is drawn, for some time, to diminish the evaporation. In dry weather the cuttings should occasionally be watered, until they have taken root. Until the third year nothing more is required than to cultivate among the young plants, and to trim them to a single stem. When three years old, the young trees should be planted out in the usual way, at distances of from 30 to 48 feet. The holes should be made large and deep, and had better be dug several months before the trees are put out. The subsequent cultivation consists in removing the suckers, trimming out the dead wood, in manuring moderately once in 3 or 4 years, digging around the roots annually, and in plowing once a year the intervals, unless a crop of grain is cultivated among them. Much difference of opinion exists in France on the subject of pruning; but unless it is deemed desirable to keep the trees low for the facility of gathering the fruit, or to diminish the risk of their being blown down by high winds, all that appears to be necessary is to remove the decayed wood, and to keep the head of the tree moderately open, for the free admission of light and heat.* With us the liability to severe gales of wind will recommend low trimming; and the same evil will probably lead to the practice of grafting on seedling stocks, the tap-root of which will insure the stability of the future tree. From cuttings, in thin soils, the roots will be too superficial for safety.

The manufacture of this oil is extremely simple; and requires no very complicated or expensive machinery. The latter consists of a mortar, a revolving stone, or some other contrivance for separating the pulp from the stones, and of rendering it a paste; a revolving stone, like a bark or cider mill for crushing the stones; a lever or screw press for the pressing of the oil from the pulp and stones; bags of coarse cloth or hair to contain the pulp; and wooden or earthen-ware vessels for receiving the oil from the presses, and for separating it from the mucilage.

As soon as the olives are ripe, which is indicated by their becoming of a dark color and soft,† they are gathered by hand, and spread out over floors to the depth of a few inches. In this situation they remain three days, being turned daily, and the decayed berries carefully picked out. They are then placed in the mortar or under a stone, and moderately triturated, until the pulp is reduced to a paste, and is detached from the stones. The stones having been removed, the pulp is then put into coarse and strong bags, and placed under the press, which should be worked very slowly at first. From the press the oil mixed with mucilage runs into wooden vessels, half filled with water. After standing from 12 to 24 hours, to give time for the mucilage to separate from the oil, the latter is decanted into other vessels, and remains undisturbed for about 20 days. It is then ready to be decanted again and finally put into the barrels in which it is to remain. During this repose, nearly all the mucilage will have been precipitated; but the oil is still liable to be *troubled* until it has been exposed to the cold.

The oil from this expression is of the first quality. The pulp or *cake* remaining in the bags from this first pressure, is then broken up, moistened with warm water, returned to

* The italicising is my own. One who has cultivated rice for 25 years, must feel the force and emphasis of this beautiful figure.

* Virgil appears to have been no advocate of the pruning-hook:

"*Contra, non ulla est oleis cultura; nequc illæ*
Procurvam exposcunt falcem———"
[Georgica, lib. ii. v. 420.

† On St. Simons the season of maturity is October.

the bags, and again pressed. The oil from it is nearly equal to the first, and may be mixed with it.

The stones having been reduced to a paste by grinding under stones, are pressed in the same way, and yield an inferior oil, of a harsh taste, and running rapidly into a state of rancidity.

The quantity of oil which may be extracted from a given weight of the fruit is stated by M. Sieuve (Nouveau Cours d'Agriculture, article *Huile*) as follows: 100 lbs. of sound olives gave 76¾ lbs. of pulp, and 22 lbs. stones. The 76¾ lbs. of pulp, when pressed, yielded 21½ lbs. of limpid oil of the first quality. The stones, having been ground, gave 6 lbs. 14 oz. of kernel, and 14 lbs. 4 oz. of woody fibre. The kernel and woody fibre gave 5¾ lbs. of inferior oil. Together making 27 lbs. of oil from 100 lbs. of olives.

The refuse of the manufacture forms a valuable manure.

The above is a mere outline of the mode of cultivating the olive, and of extracting the oil. To enter fully into the subject would occupy many sheets of paper; and such detailed information is probably foreign to your purpose, which, it is presumed, is to recommend it to the attention of the South by presenting for consideration its most important features, and to go no farther into minutiæ than may be necessary to an accurate knowledge and correct appreciation of it.

If, however, I am mistaken as to your views, it will give me pleasure to furnish you, hereafter, any farther details.

To those seeking the fullest and most practical information on this subject, I would recommend the perusal of the articles *Olivier, Huiles and Moulins* in the Nouveau Cours d'Agriculture, vol. xiii., No. 8, Paris, 1809. They form a most excellent treatise, and are from the pen of Bosc, to whom I was introduced at Paris, as one of the most able and distinguished of their agricultural writers. Bosc has taken the articles of the celebrated Abbé Rozier as his basis, but has retrenched from them much that was useless, and added much that is valuable. Should your State Society be disposed to patronize the olive—and I trust that your Address will so incline them—a translation of these Essays, accompanied by two or three plates, which would form a pamphlet of some 50 pages, will place the public in possession of the best attainable information—information not now existing in an English dress, as far as I am aware.

The experiment made by my father—who, although 83 years no longer allow of his taking an active part in field operations, is still deeply interested in the subject—has proved so satisfactory that it is my intention to prosecute it on a larger scale. We have succeeded perfectly in pickling the olive, and in making from it the finest oil I have ever tasted. This season I expect to make several hundred bottles of oil; and if I am not disappointed by a hurricane, I hope this winter to submit a sample for your critical judgment. Having now about 250 trees of various ages, and intending to increase them, I hope in a few years to be able to test conclusively the question of the olive culture in Georgia. The experiment will not be a costly one, as the ground occupied by olives is cultivated at the same time in other crops.

The following quotation from Columella, with which I will close this very long communication, (in which I have without mercy emptied out upon you my note-book,) is consolatory to the experimenter, and will, I am sure, recommend "the first of all trees" to that large class of persons who, although having their full share of a desire for good things, are equally adverse to labor and to risk:

"Longeque ex omnibus stirpibus *minorem impensam desiderat olea*, quæ prima omnium arborum est, nam quamvis non continuis annis sed fere altero quoque fructum afferat eximia tamen ejus ratio est, *quod levi cultu sustinetur, et cum se non induit, vix ullam impensam poscit.* Sed et siquam recipit, subinde fructus multiplicat. Neglecta compluribus annis non ut vinea deficit, eoque ipso tempore aliquid etiam interim patrifamilias præstat, et cum adhibita cultura est, uno anno emendatur. *Quare etiam nos in hoc genere arboris diligenter præcipere censuimus.*"* (Col. de re rustica, lib. v. cap. 7.

Requesting that you will at all times command me whenever I can be useful to you, I am with great respect and esteem, my dear Sir, your obedient servant,

J. HAMILTON COUPER.

M. KING, Esq.

STATISTICAL.—There are employed in the commerce of the Mississippi Valley 12,000 steamboats, the cost of which does not vary far from $16,000,000. On them are employed more than 40,000 men, women and boys. The annual expense of running the boats is about twice their cost, say 32,000,000. To this may be added about 4,000 flat and keel boats, employing 20,000 men at least. The value of the annual commerce of the Mississippi Valley is estimated at $430,000,000. The capital invested in vessels of all kinds on the great Northern Lakes is about $6,000,000, or one-third of that invested in boats on the western rivers.

[* *Translation.*—The olive, though the first of all trees, *requires much less care* than any other, for though it does not bear every year, but more generally every other, it has this excellent peculiarity, that *it may be kept in good order with very little culture*, and when *it is not bearing, causes hardly any expense*, though if it is then generously cared for, its yield will afterward be greatly increased. And even if it is neglected for many years, it does not die out like the vine, but even then produces something for its owner, and with proper treatment may be fully recovered in a single year. *For these reasons it is my opinion that we cannot bestow too much attention on its culture.* *Ed. Farm. Lib.*]

BOUGHT, OR ARTIFICIAL AND FARM-YARD MANURES.

It is a curious fact, and much to their credit and enterprise, that in a certain neighborhood of Montgomery Country, Maryland, there is probably a greater amount of artificial manures—or rather mineral and animal manures—*purchased* and carried on to their farms, than in any other district; entitling them to the more credit when it is considered that they are without the advantages of water or artificial conveyances to transport it.

At the same time they well understand the importance of home-made manure, and have too much good sense to consider the one as incompatible with the obligation to husband the other. On the contrary, they chime in with each other when we consider that farm-yard dung does not give back to the land all that the crops out of which it is made take from it; and hence the necessity, when it can be done, to bring on other manures to make up for that which the crops take away from, and which farm-yard manure does not supply. Therein lies the *rationale* of the case as relates to the two kinds of manure.

On this point the following observations are clear and worthy of attention, although the substance of them may have been again and again presented to the reader. There is more information—more wholesome food for reflection in remarks like these, by Professor Lindley; and by the reflecting farmer they will be turned to more account, than is or can be made, upon one-half of what is *seen* at a Cattle Show. Everything goes to show the necessity for *instruction in the principles of the art!* Without a knowledge of Agricultural Chemistry, who can, or how are we, to know the true value of either farm-yard or bought manures? A large proportion of the former is doubtless often *mere rubbish*, not worth—as the farmer would see if he could analyze it—the cost of hauling it out upon his land.

Farm-yard manure, for instance, made through the winter in an open pen, exposed to wind and weather, and composed of the offal of half dead and alive cattle, fed exclusively on wheat-straw! How much more can it be worth than the straw itself, since the cattle are merely used as machines to grind it down and condense it? The virtue of such manure, supposing the whole straw to be thus punctually restored to the land, falls lamentably short of balancing the account, when we consider what the grain has taken off. The case is very different when the grass or grain crops are consumed on the land. If home-made manure is thus liable to be of little or no value, so may be others; such as marl, guano, lime, bone-dust, &c., for they may be either poor or spurious, and the analyst only can tell. When the sciences connected with Agriculture come to be taught in our schools, though every man may not be his own chemist, we shall have such chemists abounding in the country, just as we had, on the bringing on of the War, West Point Government educated officers to drill and train the militia—and why should not the agricultural chemist be provided by the Government, or out of the Public Treasure, as well as the man of *science in the art of war?* Just because farmers are *not* educated as they should be in a knowledge of their own rights, and in a sense of self-respect, which, if they possessed, Members of Congress would not dare misrepresent them and their interests as they do on this point.

The late Mr. Wellford, an estimable and enterprising farmer of Fredericksburg, not only gave his straw to the livery stables of that place, but hauled it to them. But he sagaciously bargained for all their manure in return, whereby he not only got back his straw in the most available shape for use as a fertilizer, but it had vastly increased in value, by the addition of all the oats consumed along with it. He had the good sense to know, what every one should, and should be governed by, that the richness and value of animal manures depend upon the nature and quality of the food. We much doubt whether straw itself, and by itself, would not be more valuable if thinly spread over the grain in winter, on the Gurney plan, than it is as manure, on merely being passed, unmixed, through the bodies of domestic animals.

Remarks by Professor Lindley.

"Supposing the soil to be now in a condition of satisfactory fertility; that fertility must suffer during the growth of a crop, for the mineral portion of that crop, and some of its organic substance also, have been supplied by the soil; plow that crop under, and so far indeed, as the latter portion is concerned, you do more than restore what has been taken, for the atmosphere contributed largely to the organic part of the plant; and all that, by this operation, is made a clear addition to the substance of the soil; but so far as the inorganic portion of the crop is concerned, by plowing it in you do but restore that which you have taken. In point of fact, however, the crop is rarely, and, taking a whole farm together, never thus returned to the land—the greater part of it is generally *sold off the farm never to return*, or the whole of it is consumed by live-stock, and only part of it is restored to the soil.—Farm-yard manure—the straw of the grain crops, together with the excrements of the stock—is thus the whole produce of the land *minus* that which has been sold. We suppose that nothing has been wasted, and we are right in saying that what the farmer ordinarily adds to the land is not all that he has taken from it: the difference—lost to the soil—has been sent off the farm in the *inorganic portions of the grain*, and in the *bones* of the stock which he has sold. How shall this deficiency be made up? the *lost substance must be imported somehow, or the soil must suffer.**

Some farmers import food for stock—oil-cake, linseed, beans, barley, &c.; others purchase *artificial manures*. Both act on similar principles—they aim at supplementing the deficiencies of their own more natural supplies.

These remarks, then, illustrate the nature of the respective offices of farm-yard and artificial manures. Consider them in relation to the question of maintaining the fertility of the soil, and the latter holds the subordinate office of merely supplementing the deficiencies of the former—consider them in reference to the growth of a crop, and their relative value depends simply upon their composition—the former is often rubbish, while the latter, if genuine, may be of the highest value—the former, if well manufactured, is all-important, while the latter may be a mere vehicle for roguery. We say that, considered as the food of the plants, the relative importance of home-made and 'artificial' manures is a question to be decided by the analyst; but there can be no doubt to which the greater esteem is due when we refer to the offices they have respectively to perform. The economical manufacture and application of home manures as the cheapest method of maintaining the fertility of our soils, is a subject second in importance to none in the whole range of farm practice."

Parsnips for Hogs.—Parsnips are preferred by hogs to all other roots, and make excellent pork. By them they can be fattened in six weeks. A porker of mine 22 months old, and weighing net 750 lbs., never ate anything but raw parsnips and sour milk; and finer meat never was seen. In the use of parsnips for stock, they should never be washed, but be given as they are taken from the ground. Used in this way they are found not to surfeit the hogs and cattle, and if given freely to cows, will much improve the quality and quantity of their milk. [Prairie Farmer.

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* We do not speak here of the natural provision by which the soil is enabled to suffer large abstractions of its substance without an apparent loss of its fertility. No doubt the carbonic-acid-water which falls as rain rapidly dissolves out of the land fresh fertilizing matter in the place of what is removed by bad farming, but this cannot be urged as a justification; for under such circumstances it does but go to diminish losses, whereas under good management it would have the effect of increasing gains.

IMPORTANT INVENTION FOR THE GROWERS OF INDIAN CORN.

NEW METHOD OF DRYING GRAIN AND MEAL.

It needs no argument to show the great value of this invention, if it will, as stated—and, we doubt not, very honestly stated—"occupy less space, cost less money, take less fuel, and do more work than any other Dryers;" and when to this is added the fact that it proposes a system of desiccation which will defy the effect of sea voyages and of time—and, moreover, that, by means of it, corn meal may be delivered in England at a less price than their hay, who can fail to perceive the great power of this new invention for the benefit of the grain grower, or calculate the extent to which it will be brought into play? It is a problem to be ascertained, and the solution of which is not difficult, at what cost corn meal would profitably supersede oil-cake, barley, beans, oatmeal, &c., now used as food for domestic animals in England?

Turning back for some evidence of the sensibility we were conscious of having felt to the importance and the value to our country of employing *Indian meal* as food for cattle, and the increased demand which might be expected for that grain to be thus used, if it could be introduced in England, we find the following remarks, published in the American Farmer of April 2, 1819—more than 28 years ago—by the same hand that is now here recalling attention to that subject. It would seem to have been one of those coming events which "cast their shadows before." In a history then and there given of two remarkable beeves, the "Delaware ox" and "Columbus," fed and fattened by that experienced and judicious grazier and victualer, the late John Barney, of Delaware, we made this observation, the correctness of which universal experience sustains: "He, Mr. B., considers that, as a means of fattening cattle, this country possesses, *in its Indian corn*, an advantage over England, for which she has no equal adequate substitute. He gives the preference to *Indian meal*, over *every other species* of food, for fattening either sheep or cattle, and gives it in its dry, unsifted state. But he gives it as his opinion that a much less quantity of meal will answer, and that it is eaten with better appetite, when used in conjunction with *ruta-baga*. Of this root he has the highest opinion, concurring with Mr. Cobbett in the belief that it is sweeter and far more nutritious than any other root or vegetable used as feed for live-stock." At that time corn at Baltimore was 55 cents a bushel. If this Dryer (which we do not doubt) will perform what is specified, then will the two impediments have been removed which have heretofore prevented the use of our Indian corn meal as food for stock in England.

First—Here is a mode of drying which prevents all danger of the meal becoming sour or musty; and, *secondly*, the ports of England have been opened to the importation of it. Let us exert ourselves for improvement in all departments; hold on, in the mean time, to that which is good, and hope for the best.

Any one having doubts to express, or inquiries to make, may address themselves to the Editor of The Farmers' Library, who engages, for the interest he advocates, to tell the truth though the Heavens fall.

REMARKS.

The Patentee of "Stafford's Dryers" at a former period was very extensively engaged in milling and distilling, and for the past two years has devoted much of his time in investigating the means by which bread-stuffs may be preserved without deterioration, not only for home consumption, but for foreign ex-

portation. Numerous experiments having proved the impossibility of obtaining a uniform heat from hot air, as also the low degree of heat capable of producing a deteriorating change in the flavor of grain, flour and meal, when undergoing the process of drying; the Patentee is now confident that steam is the only agent that can be successfully used.

There is at present but one of the Patentee's Revolving Machines, on a large scale, in operation: this one is in the mills of E. W. Leonard, Esq., Elyria, Ohio, on which have been dried about 2,000 bbls. of Indian corn meal, a part of which is now on its way to Europe. Mr. Leonard's New-York correspondents write the Patentee that the meal sold has undergone a very severe scrutiny, and has been universally approved of by the Inspectors, and others who have used it.

The Cleveland Iron Manufacturing Company, who own the right for the Western Reserve, Ohio, are now erecting works for the manufacture of "Stafford's Dryers."

The recent partial destruction by fire of the celebrated Cleveland City Mills, prevents the Patentee from exhibiting samples of dried wheat flour, from a mill of known reputation, the Dryer for that mill having been nearly completed when the fire occurred. The patent having been but recently issued, the above-named are the only practical tests in which the Dryer has been applied; still sufficient is known to prove its practicability, and that its merits exceed those of any other other Dryer invented.

The surplus corn of the country, up to the present time, has been fitted for exportation by being dried with hot air, or by direct application of heat upon the surface of pans and in the inside of cylinders, which plans stand foremost in general adoption among the various methods which the importance of the cause has thrown into use, but all of which, although guided by great experience and undivided attention, impart to the grain or meal that scorched appearance and parched flavor which have effectually prevented home consumption, our own people preferring the natural color and taste, thereby leaving it for the consumption of the slave and colored population of the West Indies and South America.

The British Government having been compelled to throw open their ports for the admission of foreign grain, a demand has been produced which the people of the United States have been unable to supply. That demand has been, *bread-stuffs in a good state of preservation.* What have they received? Recent accounts inform us that nothing but the excitement which has now subsided, could have rendered marketable the article manufactured by the Drying Machines of all kinds which have been erected in almost every county in the corn-growing portion of the States.

The flood of emigration to our shores, together with the natural increase of population, are causing a yearly increase in the surplus bread-stuffs of the United States at a ratio unprecedented in the annals of any nation.

Our home demand and export to the West Indies and South America have heretofore absorbed our surplus, while the portion of surplus exported the past year has brought into requisition a great portion of the navy of the world. All will admit that the surplus of the coming year must exceed that of the past. What is to be done with it? What is to be done with the surplus of succeeding years? Capitalists or shippers will not invest in wheat, corn, flour, or meal, without deducting the risk of their becoming heated or soured on their hands. What is that risk? Does it not exceed one-fifth of the usual cost of the articles where produced or manufactured? If so, how essential to all who produce or deal in bread-stuffs, is a mode of certain preservation!

British manufacturers and British operatives have succeeded in opening British ports, that they may overcome the competition of Germany and other manufacturing States, and continue to supply the markets of the world. This they will effect if they encourage the use of Indian corn, as food for themselves, their cattle and swine. From the peculiar adaptation of our soil, Indian corn must always be produced with us in quantities to defy competition; which, preserved without deterioration, must become a chief supply of food to the poorer classes and the domestic animals of Europe. It is equally essential that the flour ground in the great wheat districts of the United States should have its moisture artificially expelled. It is generally known that Northern winter-ground flour sours readily if the ensuing summer is warm and moist. Wheat grown south of the natural district has less moisture because it grows in a less humid climate, and the atmosphere is better adapted to carry off the moisture during the process of manufacturing. The losses to millers, factors and consumers from this source within our own limits is greater than most persons would credit. These losses are so diversified that it is impossible to attain any correct estimate of the actual sum that is yearly lost by our people. If we send it abroad, subjected as it is to the damp and confined influence of a vessel on a long voyage, what losses will not then accrue?

If, during the process of drying, the grain is not well and perfectly ventilated when subjected to the greatest heat, the steam disengaged destroys its vitality and renders it unfit for food.

The usual mode of drying is to pass the grain rapidly over highly heated surfaces which burn more or less of the bran, thus flavoring the meal. The grain being highly heated is thrown into a pile where the hot steam generated from its internal moisture, passing through the mass, completes the work

of destruction. The grain when cooled is ground. The steam condensed, while cooling and remaining in the grain, is sufficient to create fermentation in the meal in a short time, if exposed to a warm climate.

Flour and meal being broken into small particles, their contact with a surface under a low degree of heat, rapidly expels the moisture from each particle if kept in constant motion. If, then, each particle is brought into contact with a not highly heated surface, and the ventilation being perfect, the process must be a perfect one. To farther impress the necessity of free ventilation, the Patentee states that the quantity of water contained in winter-ground flour, manufactured at the best mills in the North and Western States, varies from 11 to 20 lbs. per barrel; summer-ground contains from 10 to 14 lbs. Absolute dryness is not required to prevent flour from souring if retained in the northern climates of the United States, but enough moisture should be expelled to prevent fermentation.

Indian corn in the spring that will make 196 lbs. of meal contains from 30 to 35 lbs. of water; as the season advances the quantity of water lessens. These facts sufficiently prove the necessity of drying grain and breadstuffs artificially by a uniform heat, and having a perfect ventilation for the almost incredible amount of moisture which is expelled during the process of drying. Thus prepared, flour and meal can *never spoil* without being subjected to influences not usual in the storage of such articles. All grain that is heated and not musty may be restored to its original soundness. As soon as corn can be shelled it may be dried so as to be merchantable; this frequently occurs in the latter part of October, if the season has been dry; thus new corn may be brought upon the market in competition with the old if the price will warrant.

Cob meal (which is the corn and cob ground together) must become an article of large export from the United States. As an article of nutritious animal food it stands unrivaled; the cob contains nutriment until the grain is perfected, which does not occur until full six months after it is ripened (so termed.) The nutrition does not wholly consist in the saccharine left in the cob, but consists in its use in distending the stomach and intestines of the animal that perfect digestion of the meal may take place, while the effects of feeding the meal alone are that it sours on the stomach and produces a scouring effect. Animals differ from man in requiring their food prepared without deterioration from the natural flavor; hence cob meal can only be prepared with certainty by the process of steam heat and perfect ventilation.

Many persons are of the opinion that the experiment of sending corn and corn meal to Great Britain has been tested and failed. They only look upon the surface of things. The question arises, when bread-stuffs assume their usual level, At what rate can corn and cob meal be placed in British ports? For surely if they can obtain it low enough they can use it. Corn can usually be obtained on the Western rivers at from 15 cents to 20 cents per bushel; say 4¼ bushels per bbl., at 20 cents, is 85 cents—barrel 30 cents (tierces would cost less); freight to New-Orleans per bbl. 30 cents; charges at New-Orleans 10 cents; freight to Great Britain 60 cents; milling and drying 10 cents—is $2 25 net cost. Has corn meal (a good article) ever reached that figure in any of our own markets on the seaboard? The cost of cob meal would be considerably less—call it one cent per pound, delivered in Liverpool or London—just half the price of hay in those cities, and one-third of the price of oil-cake, of which the British take all our surplus.

With us it must come into universal use when it can be obtained.

The consumption of corn meal in our own cities and towns would be more than double could the people obtain it in a state that it would keep and still preserve all the freshness and flavor of a recently ground article.

Why is it that the cotton-gin is an essential to the South? Because with it only can they prepare their cotton for a market. Why, then, are not these Dryers, or some other efficient mode that will preserve our breadstuffs without change of quality, color or flavor, equally essential to the North and the great valleys of the West, which are and ever will be only producing States?

If Europe encourages the use of Northern and Western products, how dissimilar will our interests be from that of our Southern brethren?

The advantages claimed by the Patentee for the Rotary and Stationary Dryers over all others, are—

1st. That they dry all substances without the possibility of change of quality, color or flavor.

2d. They occupy less space, cost less money, take less fuel, and do more work than any other Dryers.

3d. The only attention required is to keep up steam sufficient to blow off at the valve weighed at any desired pressure.

4th. The motion of the Rotary Dryer, the feed of both Dryers, and the heat being uniform, with sufficient capacity of Dryer, a given amount of grain or other substances must be dried, without destroying their vitality.

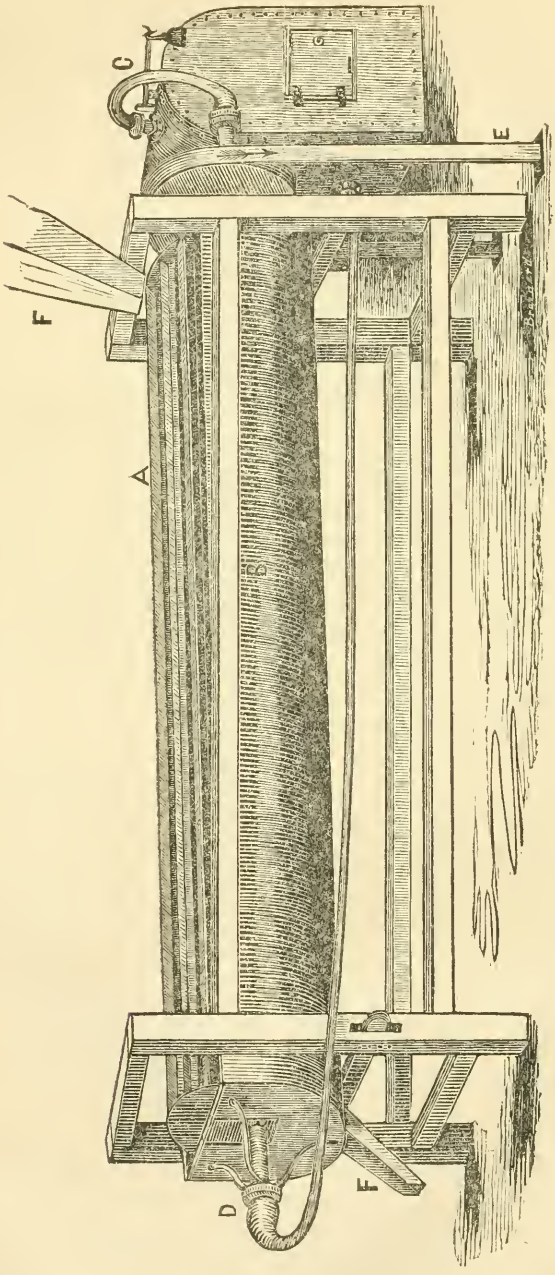
5th. That the principles involved and patented in these Dryers preclude the possibility of substituting any other efficient mode of attaining the desired end.

The Patentee is fully aware of the importance of his invention. Yet he knows that but a moiety of the benefits arising from its sale or use, can recur to him; he therefore offers to the public either to supply machines, or to sell territory in portions desired.

Letters post-paid, addressed to J. R. Stafford, Cleveland, Ohio, will meet due attention.

Cleveland, September, 1847.

Fig. 1.



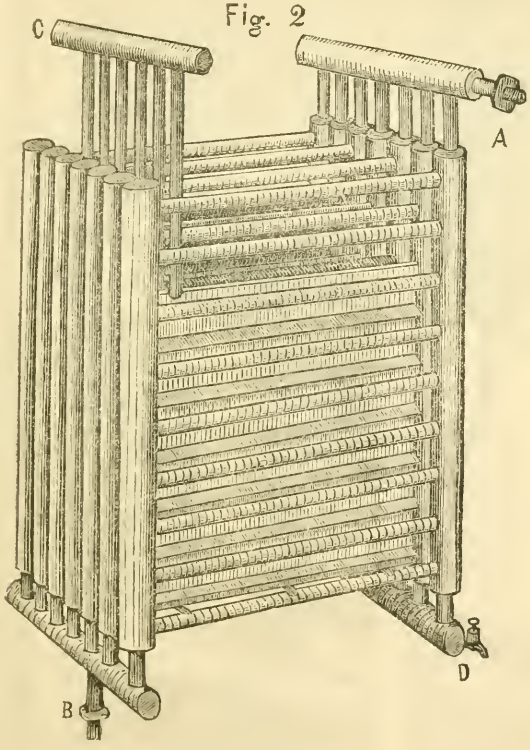
STAFFORD'S ROTARY DRYER.

DESCRIPTION.

Fig. 1 represents Stafford's Rotary Dryer and Cooler, for drying and cooling grain of all descriptions, flour, meal, and other substances.—A is a revolving cylinder made of iron. to which are attached numerous metallic flanches, as shown.

B is the trough in which it revolves; steam is admitted at C, which heats the cylinder and flanches; the condensed water is thrown out of the cylinder at every revolution and flows back into the boiler by the pipe D. The cylinder and trough lay on an incline as shown. Grain, flour, meal, or other substance, is spouted on to the top of the cylinder at the upper end. The cylinder is revolved in the direction of the arrows by means of the belt E. The substance to be dried is carried over the cylinder several times, gradually working its way to the lower end, where it is conducted off by the spout F. All ground substances may be retained on the cylinder until all the moisture they contain is expelled. Grain may have the greatest portion of its moisture abstracted on the cylinder, then be spouted into a pile, where the heat engendered by contact with the cylinder and flanches will carry off the balance of the moisture without injuring the grain. The different uses for which this Dryer may be adapted are as follows: For drying flour. *If by the miller*, it gives him a greater yield, as it bolts freer, and no flour adheres to the offal. He loses the moisture, but the 196 lbs. of flour will absorb again the water abstracted when made into bread. It preserves his flour, and the consumer pays him more money for it. *If used by the factor or commission merchant*, he is enabled to preserve flour that he fears will sour. *If used by the distiller*, it enables him, 1st, to extract the sour water from corn, which promotes acetous fermentation before the vinous or saccharine fermentation has developed the spirit contained in the grain. 2d. It enables him to bolt and separate the meal, that the fine and coarse may not be scalded together, as the scald sufficient for the barm would destroy the fine. 3d. It enables him to get rid of the hulls, which, when saturated, sink to the bottom of the vat, and are forced to the top during fermentation by the quantity of carbonic acid gas generated under the mass—a portion of which gas distills into carbonic acid, which is known as the most fatal ingredient to saccharine fermentation.

Fig. 2



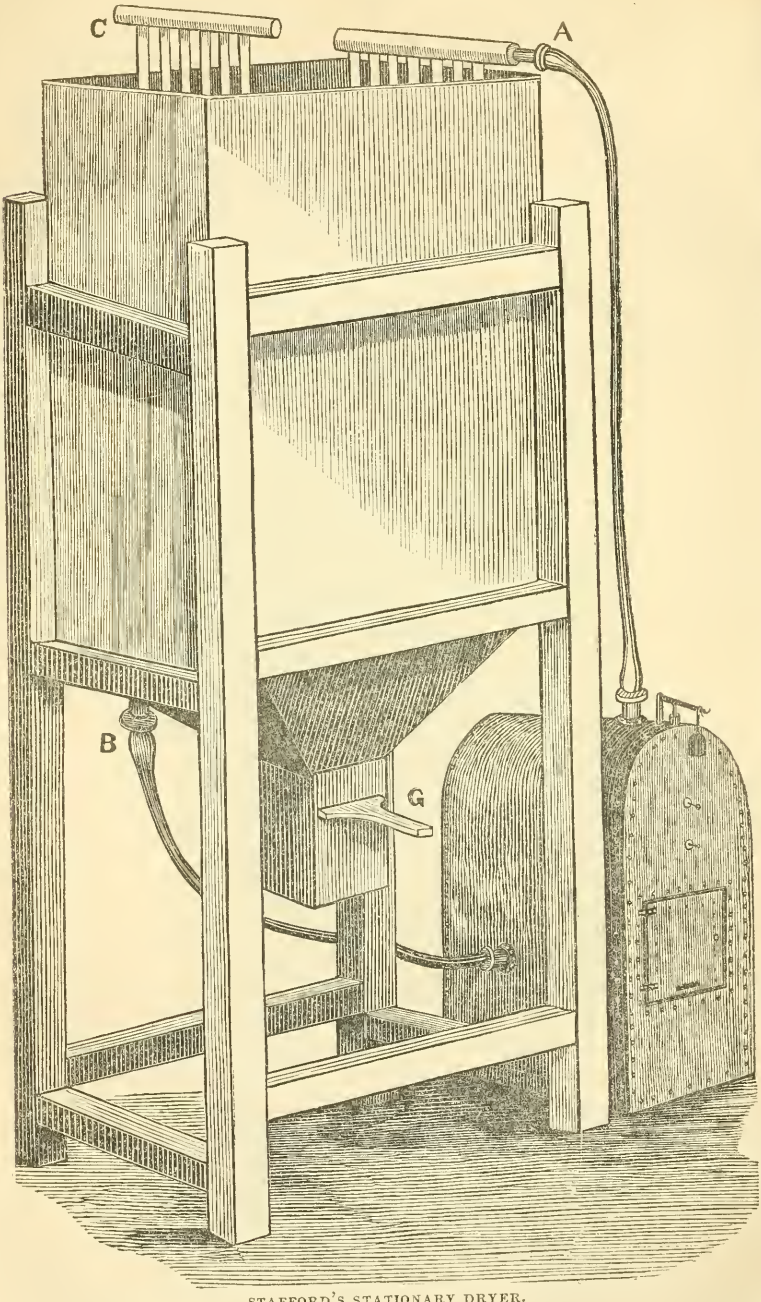
If used by the brewer, it enables him to dry his malt more speedily, with less labor and expense, and to dry it without change of flavor or color.

If used in a steam saw-mill, the escape steam may be used to heat the Dryer, and the saw-dust as it comes from the saw may be poured over the cylinder, dried and consumed.

If used by the miller, warehouseman, or shipper, for drying grain, it accomplishes the object without the least possible risk of injury to color or vitality.

The claim upon which the patent for the above

Fig. 3.



STAFFORD'S STATIONARY DRYER.

is based covers the principle of drying on the surface of cylinders; and, as flour and meal are not conductors, it is absolutely indispensable that all the particles should come in direct contact with a heated surface, and should almost immediately be exposed to a free ventilation, that the moisture can escape. This can only be done on the outside of a cylinder, for when done

on the inside a sliding motion is given to the mass. If flanches are attached to the inside to give a falling motion, the air circulating through the cylinder must carry off the finer particles as well as cool the cylinder. The difference between drying on the inside or outside of a cylinder of 40 inches diameter, is that the grain or meal cannot occupy more than 40 inches of surface in the former, while it occupies 360 inches of surface of cylinder and flanches of the latter; and instead of heating massive ovens *(when it is impossible to keep a uniform heat)* for pans and cylinders to revolve in, the heat generated within a cylinder is all absorbed by the substance drying. The following is the claim referred to. It will be observed that no particular form, size, device, or heating agent is patented, but the principle is amply reserved.

CLAIM.—What I claim as my invention, and desire to secure by letters patent, is the method of drying or cooling grain, flour, meal, or other substances, on the *external surface* of a hollow cylinder armed with flanches or *other devices*, arranged and operating *substantially* as herein described, and combined with a trough: the cylinder to be filled with hot air or steam when used for drying, and with cold air when used for cooling purposes, as herein described and set forth.

Fig. 2 represents Stafford's Stationary Dryer when removed from the case. The steam is admitted at A, figs. 2 and 3, and fills the tubes; when condensed it passes back into the boiler by the pipe B, figs. 2 and 3. Pipe C connects with a series of flat perforated tubes, into which the vapor from the grain disengaged by the heat is conducted through numerous apertures which are under incline I, I, I. The inclines also serve to direct the grain on the heating tubes. Grain or other substance to be dried is admitted into the Dryer by a spout above it, and obtains its exit through the regulating gate G. D is a faucet for drawing off the condensed water that may accumulate in the small portion of Dryer shown. Grain may be retained within the case until all the moisture is expelled from it, or a majority of the vapor may be disengaged, when if spouted into a pile the heat retained will disengage enough of what moistnre may remain as will leave the grain in a safe condition for shipment. Damp grain should remain for some time among the tubes to insure it against fermentation and injury in the pile. It will be seen that this Dryer requires NO MOTIVE POWER. It requires but little fuel or boiler, as the condensed steam is returned to the boiler as fast as it is condensed. To dry 5,000 bushels of grain per day would not require the occupation of more than *six feet square on a floor!* It will be perceived by the following claim that the invention is not limited to any peculiar form, but that it comprehends the *only effective stationary Dryer that can be constructed.* Its uses are principally adapted for drying grain; ground substances would clog the tubes and apertures which carry off the moisture.

CLAIM.—What I claim as my invention, and desire to secure by letters patent, is the improved apparatus for drying grain or other substances, composed of a box or casing, having a regulating gate at its base, and having a series of heating tubes or *surfaces* within the casing, combined with a series of perforated tubes or *other devices* for carrying off the vapor disengaged by the heat; the whole arranged, combined, and operating upon the grain or other substance during its passage through the box or casing *substantially* in the manner herein set forth.

J. R. STAFFORD.

HEMP AND FLAX HUSBANDRY.

IN THE FARMERS' LIBRARY of May last appeared an engraving of a Flax-Brake, then just invented by F. P. HOLCOMB, Esq. of Delaware, which gave fair promise of supplying the desideratum so long wanting on that subject—to wit, an expeditious preparation for the manufacturer, without injury to the fibre. Whether, Delaware not being a hemp-growing State, the machine has not enjoyed an opportunity of being favorably introduced; or whether the machine itself, though good in principle, may have been deficient in power; or what was or is the precise difficulty, if any, we have not understood, but would like to be informed—because, although we gave it only for what it was worth, and what was honestly believed by our correspondent to be its capacity and value, still we recognize the obligation which rests upon us always to tell the *cons* as well as the *pros*—the against as well as the for—whatever may be recommended in the pages of THE FARMERS' LIBRARY. *Fiat justitia ruat cœlum.* Of the machine which we take pleasure in here presenting to public notice, and especially to the notice of all concerned as cultivators or manufacturers, in the Flax and Hemp Husbandry of the United States, it may with confidence be said in its favor that few persons, if any, in the United States, have given as much attention to the subject, in all its aspects, with equal capacity and opportunities to form a safe

and correct judgment, as Mr. ANDERSON, of Louisville, Kentucky, the patentee of the Brake.

Then of Mr. SANDERS—who we believe has the agency for selling the rights—on personal knowledge we can add that he is among the oldest and most zealous promoters of agricultural improvements in our country, and that he has passed the best portion of an active and useful life in the midst of a Hemp region.—Moreover, it may be farther stated that one of the largest and most accomplished manufacturers of Hemp and Flax in this country, anxious on this subject, and every way disinterested in this case, has expressed to us his strong persuasion that in this machine we are at last presented with the long-sought *desideratum;* that is, one which will expeditiously prepare the article for the manufacturer, while it develops and preserves the fibre in all its elasticity, strength, and every valuable quality.

Mr. SKINNER: NEW-YORK, September 20, 1847.

Sir—An old correspondent of *your* American Farmer wishes to call the attention of persons interested in the growth and in the manufacture of Hemp and Flax, to the recent discoveries made by Mr. JAMES ANDERSON, of Louisville, Ky., both as to the preparation of Hemp and Flax, and to his newly-invented Brake.

First as to the preparation: It is a fact well known to modern chemists that organic vegetable matter which contains nitrogen in the largest quantities is most prone to fermentation and putrefaction, which occurs spontaneously when it is subjected to moisture and heat.

Hemp or Flax contains nitrogen or azotized matter, and of course readily runs into spontaneous fermentation when exposed to moisture and heat.

In preparing Hemp or Flax for the Brake, persons heretofore have availed themselves of the process of *dew* or *water* rotting, in which the greatest care is required not to materially injure the fibre; but no Hemp or Flax can pass through these processes without more or less injury. Even under the most skillful treatment the fibre is partially weakened; but the maceration and decomposition has been found necessary to enable the operator to readily brake and clean it.

The albuminous matter which is incorporated in the harl of Hemp and Flax, in large quantities, with the fibre, is the first to decompose; it therefore becomes necessary to render that insoluble and the azotized matter therein inert, if it is retained.

Mr. Anderson effects this by the application of any known antiseptic. He has used the sulphate of iron, and also the sulphate of alumina and potassa, with satisfactory results—producing a chemical change in the azotized matter in the Hemp; rendering it unsusceptible of either fermentation or putrefaction; giving unusual durability; adding greatly to its strength; producing an article superior to the best Russia Hemp.

Vats of wood or masonry are constructed, suitable for the farm. As soon as the Hemp is cured, the operation may begin. For the convenience of putting in and taking out, it should be tied in convenient sized bundles, cutting off the seed ends (five or six inches) with a broad-ax, on a block, handling it neatly: the vat then to be filled with as much Hemp as it will hold. For every fifty gallons of water required to fill the vat after the Hemp in the straw is placed in it, dissolve four ounces of the sulphate of iron, which is recommended for Hemp; fill the vat with this liquor; then, as soon as it is fully saturated, it is finished. Ten or twelve hours is long enough, but staying in longer does no injury; as soon as it is dry it is ready for the Brake.

Pursue the same process for Flax, but, instead of the sulphate of iron, use the sulphate of alumina and potassa. The alum liquor does not change the color—the iron liquor darkens it. By this process the farmer gets his crop to market at least six months sooner than by either dew or water rotting—the product being at least sixteen per cent. greater, as there is little or no waste from tow or over-rotting.

Test experiments have been made in Louisville, Kentucky, taking four samples of Hemp.

No. 1, a sample of Dew-rotted Hemp.
No. 2, .. Water-rotted ..
No. 3, a sample of Riga Rein Hemp.
No. 4, .. Rhodian* ..

These samples were subjected to moisture and heat alternately, each treated precisely alike. No. 1 first became decomposed; next No. 2, and soon after it No. 3: all three completely rotten—No. 4 remaining sound, strong and sweet.

As to the Brake: I send you a drawing of the model of the Brake, deposited by Mr. Anderson in the Patent Office; since then, however, he has changed his plan of working the rollers. As soon as I return to Louisville I will send you a drawing of the perfect machine. It is very simple, and easily made—costing about $200 for a machine. The rollers and gearing are made of cast-iron—the frame of wood. But little power is required to drive them; two horses will be sufficient for one machine, cleaning a ton of Hemp per day.

LEWIS SANDERS.

I have left at the American Institute, in the City of New-York, four samples of Flax, for the examination and inspection of persons interested in its growth or manufacture:

Flax in its natural state.
.. water rotted.
Flax steeped 12 hours in iron liquor
.. .. .. alum ..

THE COMPOSITION OF FLAX,

AND HOW TO MANAGE ITS CULTURE WITHOUT INJURY TO THE LAND.

As connected with the preceding communication relative to the discovery of a new and effectual Hemp and Flax Brake, by Mr. ANDERSON, of Kentucky, we give the following from a recent Lecture by Professor JOHNSTON:

COMPOSITION OF THE ASH OF THE STEM OF THE FLAX PLANT.

CONSTITUENTS.	Heestert Courtrai District.	Escamaffles Courtrai District.	Hamme Antwerp District.	Holland.	Near Dublin
Potash	7·697	22·857	22·30	18·41	9·78
Soda	19·186		14·12	10·91	7·70
Chloride of sodium	8·213	8·701	4·59	5·65	3·99
Lime	15·279	16·483	18·33	18·37	12·53
Magnesia	5·446	3·332	3·93	3·02	7·79
Oxide of iron	4·501	1·523	1·10	2·36	
Alumina	0·444	0·438	0·72	1·44	6·08
Oxide of manganese	trace	trace	trace		
Sulphuric acid	6·280	6·174	6·83	9·68	2·65
Phosphoric acid	11·206	11·802	8·81	11·06	10·84
Carbonic acid	20·599	25·235	16·38	13·75	16·95
Silica	3·056	3·409	2·68	5·33	21·55
Total	100·007	99·954	99·99	99·98	99·46
Per centage of ash	4·237	5·454	3·67	5·15	5·00

After a few remarks on this Table, Professor JOHNSTON went on to say that as in medicine a knowledge of the disease was half the cure, so in Agriculture a knowledge of the disease—for they might call that a disease which was an exhaustion of the soil—enabled them to supply to the soil what was taken from it by the crop. As a means of doing this, he showed that if the seed and bole and husk were mixed, they formed excellent food for animals, and in proportion as they saved these things they increased the quantity of manure. He need not explain how the seed was used in fattening cattle; he would only say that the seed and bole contained the combustible matter of plants, that which by a wonderful process of chemistry in the bodies of animals became transformed into bone, muscle and flesh, and finally escaped from the animal, to enable them to grow richer and richer crops. The subject of employing the seed he would leave to those who had to follow him; and with regard to the increased value of the manure, he referred to Warnes's system of box feeding, which was designed to insure not only a larger quantity of beef, but to increase

* The name given to Mr. Anderson's new process.

the quality of the manure by the manner in which it was made; and, as far as he understood it, he thought manure was rendered more valuable to them than by the ordinary system. He had prepared a recipe to restore to the soil the ingredients which were taken from it. It was as follows: *Manure for Flax.*—Bone dust, or bones dissolved in sulphuric acid, 25 lbs.; gypsum, 10 lbs.; pearlash, 20 lbs.; soda ash, dry, 20 lbs.; slaked magnesia lime, 25 lbs.; or for the last may be substituted crude sulphate of magnesia, 20 lbs.; and quicklime mixed with it, 5 lbs. 150 lbs. of this represent 150 lbs. of the ash of the plant, or 200 lbs. of the dry plant, say a ton of dry flax. An average crop is 800 lbs. 50 stones dressed flax, or 6,400 lbs. (three tons nearly) flax plant, containing 320 lbs. of mineral matter. 4 cwts. to 6 cwts. of the above must be added to the land to supply the loss; or 3 cwts. and a good half manuring. The Flax Society of Ireland stated that experience showed that a flax crop was best after wheat, but the practice varied according to the district, and something must be left to the discretion and more to the judgment of the agriculturist. Flax of good quality should be pulled before it was dead ripe. Very great care was indeed required generally in the management of flax. The times of steeping and pulling and grassing must be carefully attended to, as, if left a day too long under these operations, the quality of the fibre would be affected. It should be cultivated by persons who can look after it themselves, for if left to a second person, there might be a considerable loss of profit. The seed should always be saved; and lastly, there should be but one crop in seven years. He did not say that Chemistry would not enable them, in time, to have a frequenter crop of flax, but they must depend more upon the mechanical condition of the soil. If they used implements as the means of improving the mechanical condition of the soil, and Chemistry for its chemical improvement, he believed the time will come when they would grow any crop they pleased on any soil they liked, with profit to the farmer.

LINSEED AND OIL-CAKE, AS FOOD FOR STOCK.

DIFFERENCE IN VALUE BETWEEN FOOD CRUSHED AND UNCRUSHED.

Some notion of the earnestness and progress of agricultural investigations, as they are going on now in England, may be obtained from the following observations by H. S. Thompson, Esq. at a public meeting in England, where the subjects of lecture and discussion were—the Culture of Flax, and the Value of Linseed and Oil-Cake.

It is scarcely necessary now to inform the reading farmer that the great inducement there to the use of Linseed and Oil-Cake—the latter of which is consumed in great quantities as food for stock—is the *richness that they impart to manure.* But for that consideration it is doubtful whether they would be used in that way; just as our Yankee farmers would forbear to rear and feed their own hogs, but as *manufacturers of manure.*

There are few things about which there is in this country less general information than on the subject of the extent and value of Oil-Cake or Flax-seed as food for domestic animals!—to what extent used—where purchased—at what price—with what effect—and might not both be used in that way much more extensively and with economy? We will give a year's publication of The Farmers' Library and Monthly Journal of Agriculture, making two volumes of 600 pages each, as a premium for the best Essay which may be supplied on the subject at any time between this and the first day of January next—with exact references to places, prices, quantity to be used, and cost as compared with corn meal, &c.

H. S. Thompson, Esq. said the question had been so fully and so ably discussed by Professor Johnston, and he had touched on so many points bearing upon the subject, that he should endeavor to be as brief as possible in the few remarks which he wished to make. There were a few points connected with the use of the seed when grown in this country. The first point on which I shall make any remark is, the comparative advantages of using

Linseed and Linseed cake. The ease with which a few cwt. of Linseed cake can be procured when wanted, and the very trifling trouble attending its use, are strong arguments in its favor; and I will at once admit that no equally convenient substitute can be found for those who go on the make-shift system, and who merely order a few cwt. of cake when their turnips come to an end, or to finish off a rather better bullock than ordinary. I am confident, however, that the time is not far distant when the great majority of farmers will see that the best way of keeping their farms in a productive state is to fatten a certain number of beasts for every hundred acres of arable land; and to any man who arrives at this conclusion, I have no hesitation in recommending the use of *Linseed* in preference to *cake*. In the first place, we know that the inferior samples of Linseed are always selected for crushing—so much so that, taking the quotations from the *Mark-Lane Express* of last week, I find that the price of English Linseed for sowing was from 50s. to 60s. per quarter, while that for crushing was from 46s. to 49s. It is hardly necessary for me to mention that this difference in price is entirely owing to the difference in quality. A parcel of seed which is so full of seeds of weeds, or which has been so much damaged on its voyage as to be quite unsalable to those who buy for their own use, has only to be passed through the mill to be transformed into what goes by the name of a very useful cake. It may be thought difficult to select a sample of Linseed, but a very little practice will enable any man to ascertain the only three particulars which are important, viz. the weight, color, and freedom from seeds of weeds. The next point of superiority of seed over cake is the value of the oil as an article of food. As Professor Johnston has so fully explained the scientific part of the subject, I will only state that to keep up the heat of the body, especially in cold weather, the animal lamp requires as constant a supply of fuel as the lamps in our houses, and I believe they cannot be more economically supplied than by the oil which is contained in a moderate daily allowance of prepared Linseed. In Mr. Marshall's Prize Essay, published in our Transactions of last year, you will find other advantages mentioned as the result of using Linseed as food for cattle; and as I have followed his plan for one whole winter and part of another, with the best results, I can safely recommend it to all who have a sufficient number of cattle to make it worth their while to put up the necessary apparatus. As soon as I had ascertained that this method of feeding cattle was successful, I thought it desirable to try some experiments, with a view to determine the degree of fineness to which it is advisable to crush the seed, and the length of time required to boil it, so that the whole goodness of the seed might be extracted during digestion.—My first point was to ascertain whether it was absolutely necessary to crush the seed at all; the plan I adopted to satisfy myself was that of boiling a certain quantity of whole seed, and an equal weight of crushed seed. I then washed each separately on a fine sieve, and when dried at a heat of 212°, I weighed them again to ascertain what each had lost. I found that

	Soluble.	Insol.
1000 grains of uncrushed seed, boiled one hour, gave	155	845
1000 ditto, crushed ditto	475	525
845 grains crushed and boiled again one hour, gave	351	494
525 grains re-crushed and boiled again ditto	83	442

This and other experiments of the same kind, from which I obtained similar results, made it quite clear that the unbroken seed was able to resist to some extent the action of boiling water, but it was still possible that the nutritive matter contained in the seed might be extracted during digestion. I accordingly had a certain quantity of seed boiled two hours, and given whole to one of my beasts. The herdsman was then directed to wash a portion of the dung and examine it closely. A certain portion of the seed was in this way found to have passed through the animal whole, and, after being well washed and dried, was compared with a portion of the seed which had been boiled, but had not passed through the animal:

500 seeds digested after boiling two hours, weighed	27½ grains.
500 ditto boiled two hours	27 3-10 do.
500 ditto fresh	38¼ do.

To make it still more certain that the seed which had undergone the process of digestion was still of value, he had a certain portion of it crushed and boiled an hour, when 100 grains gave 81 soluble and 19 insoluble. In this experiment it was found that a considerable portion of the seed had been crushed by the teeth of the animal, as there were numerous skins of the seed mixed with those that were still whole; and in all cases where the skin was broken, the whole of the kernel had gone—thus showing that the gastric juice had the power of fully dissolving the kernel when the seed was crushed, however roughly. I tried numerous other experiments to ascertain how long it should be boiled. These it would be tedious to relate, but the results I would shortly state as follows: First, that if the seed be well crushed, boiling for one hour will extract the goodness of the seed as completely as boiling for three or four hours if roughly crushed. When, however, the meal is fine, there is great danger of its burning to the bottom of the pan, unless cooked by steam.—There seems, however, to be no necessity for either fine crushing or long boiling. Either one or the other makes the gruel thicker and more glutinous; but the animal has certainly the power of extracting all the nourishment from the seed when roughly crushed and lightly boiled; and to do more than make it digestible would of course be superfluous labor. The last point which I shall mention is that those who may wish to use Linseed on a

small scale may do so at a very trifling expense by boiling it in a common iron pan or boiler; and to prevent any danger of its burning to the bottom, the Linseed may be put into a coarse canvas bag, hung by a string to a stick, laid across the boiler—the string to be of such a length that the bag cannot touch the bottom of the pan. After boiling for a short time, the bag may be turned inside out, and the gruel mixed with the chaff or chopped straw. To recapitulate shortly: I prefer Linseed to cake, because I know what I am giving to my cattle, and on account of the value of the oil contained in the seed. I also consider it indispensable that the seed should be crushed, but do not think it necessary to have it made into meal. Lastly, it is a mistake to suppose that any expensive apparatus is required, as the price of a seed-crusher is not more than that of a cake-crusher; and the only other utensil indispensably required is a common iron pan or boiler, which almost every farmer already possesses.

AN ESSAY ON THE CONDITION OF A STALLION.

The word *condition* is used by horsemen in a different sense from that in which it is understood as applied to cattle by the mass of farmers. By *condition* the farmer often means a high state of fatness; the horseman, on the contrary, makes use of the word to indicate the greatest health and strength produced by *reducing* all superfluous fat, bringing the mere flesh into clean, hard and powerful muscle, and invigorating the lungs and other internal organs, so that they may promptly discharge their respective functions, and suffer no damage from uncommon stress—the whole in order to the animal's performing labors and sustaining a continuance of action to which he would not be adequate without such especial preparation.

By the *Condition of a Stallion* is meant the state of the system in which the male horse should be kept, in order to deriving from him the greatest excellence in the progeny.

Too many persons are content to breed their mares to a horse whose figure suits them, without regard to his *condition*. The mention of one prominent instance alone will be sufficient to show that good condition is essential to the production of a valuable progeny. A remarkable case occurred in England some years since, in so high a quarter as to attract public attention, and consequently the fact of the account's obtaining currency without contradiction is a fair evidence of its correctness. The Prince of Wales, who afterward became George the Fourth, owned, and was in the habit of riding as a hunter, an entire horse of unequaled excellence. In consequence of this horse's superior qualities, His Royal Highness caused a few of his own mares to be bred to him in the spring, after he had been kept in the highest condition as a hunter throughout the winter, and the produce, on growing up, proved every way worthy of their sire. When His Royal Highness, as Prince Regent, became seriously engaged in the cares of Government, and therefore relinquished the pleasures of the chase, being desirous to perpetuate the fine qualities of this stock, he ordered the horse to be kept at Windsor for public covering, provided the mares should be of the first quality; and in order to insure a sufficient number of these, directed the head groom to keep him exclusively for such, and to make no charge, with the exception of the customary groom's-fee of half a guinea each. The groom, anxious to pocket as many half guineas as possible, published His Royal Highness's liberality, and vaunted the qualities of the horse, in order to persuade all he could to avail themselves of the benefit. The result was, the horse being kept without his accustomed exercise and in a state of repletion, and serving upward of a hundred mares yearly, that the stock, although tolerably promising in their early age, shot up into lank, weakly, awkward, leggy, good-for-nothing creatures, to the entire ruin of the horse's character as a sire—until some gentleman, aware of the cause, took pains to explain it, proving the correctness of their statements by reference to the first of the horse's get, produced under a proper system of breeding, and which were then in their prime, and among the best horses in England.

Almost every observing farmer in this country has remarked that whenever, within his knowledge, an ordinary work-horse has, by chance, covered a tolerably good mare, the foal thus produced has, at maturity, almost invariably become a better animal than it was expected to be, and in many cases proved quite superior to the get of the high-priced and highly pampered stallions of the neighborhood. What was the cause of this? Condition. The work-horse, by constant and severe exercise, was brought into health and strength, and his stock partook of the state of his system at the time of copulation. Why is it that many experienced farmers, after having tried the best stallions within their knowledge, frequently resort to the keeping of one of their own colts or farm-horses entire, for the service of their mares, and actually obtain as large and as good and salable stock from such a one, as that from the public stallions of far superior size, form, blood, and all other qualities, except this indispensable *condition?*

It may be stated that, generally, whenever the get of a stallion has proved, at maturity, to be of remarkable excellence comparatively with the sire, such horse has been, at and previously to the time of getting such valuable stock, kept without pampering, without excessive sexual service, and with a good share of exercise or labor.

To show the effect of a peculiar state of the system in the parents at the time of copulation, instances may be cited from various sources. We will content ourselves with two—and first take a lamentable case in the human species as given in the valuable work on "The Constitution of Man," by George Combe:

"In the summer of 1827, the practitioner alluded to was called upon to visit professionally a young woman in the immediate neighborhood, who was safely delivered of a male child. As the parties appeared to be respectable, he made some inquiries regarding the absence of the child's father, when the old woman told him that her daughter was still unmarried; that the child's father belonged to a regiment in Ireland; that last autumn he had obtained leave of absence to visit his friends in this part of the country, and that, on the eve of his departure to join his regiment, an entertainment was given, at which her daughter attended. During the whole evening she and the soldier danced and sang together; when heated by the toddy and the dance, they left the cottage, and after the lapse of an hour were found together in a glen, in a state of utter insensibility, from the effects of their former festivity; and the consequence of this interview was the birth of an idiot. He is now nearly six years of age, and his mother does not believe that he is able to recognize either herself or any other individual. He is quite incapable of making signs whereby his wants can be made known, with this exception, that when hungry he gives a wild shriek. This is a case upon which it would be painful to dwell, and I shall only remark that the parents are both intelligent, and that the fatal result cannot otherwise be accounted for than by the almost total prostration or eclipse of the intellect of both parties from intoxication."

For another instance of a peculiar constitution derived from a parent at the time of copulation, and owing to a temporary excitement of the animal, a respectable farmer related to the writer of this Essay that he witnessed the effect of pain and nervous agitation on a stallion just before the moment of covering, in the production of a wild, timid, violent and worthless colt. The sire was in repute as one of the best horses ever kept in the district; and his stock afterward justified the opinion. The groom became angry and beat him in his stall in a cruel manner, and then led him out and allowed him to cover the mare, which was one of a perfectly quiet and orderly temper. The consequence was the production of an animal totally valueless, as above mentioned.

That the doctrine here held is no "new thing under the sun" is evident from many venerated authors. Plutarch says "The advice which I am now about to give, is indeed no other than what hath been given by those who have undertaken this argument before me. You will ask me what is that? 'Tis this, that no man keep company with his wife for issue sake, but when he is sober—as not having before either drank any wine, or, at least, not to such a quantity as to distemper him; for they usually prove wine-bibbers and drunkards whose parents begot them when they were drunk: wherefore, Diogenes said to a stripling somewhat crack-brained and half-witted, 'Surely, young man, thy father begot thee when he was drunk!'"

Shakspeare intimates the same belief in making a hero insult his enemies with the taunt

"For ye were *got* in fear."

On no other known principle than this *condition*, or a peculiar state of the system at and before the time of copulation, can be explained the important fact which forms at once a criterion of skill in the scientific breeder, and a stumbling-block to the ignorant and unreasonable one, who would expect success without giving himself the trouble of investigating the natural laws which govern the subject of his operation: such a person is too apt to argue within himself that because the same parents at different times produce offspring of opposite characteristics, there can be no certain rules by which to create determinate qualities in the progeny; such a one would maintain that, because all the children of one married couple are usually somewhat different in characteristics from each other, there can be no means of predicting, with an approach to certainty, the qualities to be produced in the offspring by a particular sexual intercourse. Now this *law of condition* accounts for the difference between individuals produced at several births from the same parents. The case of twins, in the human species, serves to strengthen this argument, inasmuch as the two persons produced at one birth usually bear a close resemblance to each other, in all respects.

It is known that ideal impressions on the female parent, subsequent to conception, frequently take permanent effect on the offspring. That such causes do not usually give the leading characteristics to the progeny, is evident from these considerations:

1st. The consequences of such impressions on the female, are usually somewhat of an unnatural or monstrous order, being different from the traits of either parent, and from the common nature of the variety to which the animals belong.

2d. It is a settled point with breeders that the progeny is more strongly characterized by the traits of the male, than by those of the female parent. This fact is well known; and indeed it can hardly be expected otherwise than that the sex which bears so much the stronger impress of character, should impart the more visible resemblance to the offspring.

3d. It is an ascertained law of Nature, that peculiarities of climate, food, occupation and most other circumstances affecting the well-being of an animal, produce in its constitution a change such as is necessary for the welfare of the species; and that this proceeds throughout many generations, until the animal becomes completely adapted to the circumstances of its existence. [The same thing occurs in the vegetable kingdom.]

This last consideration, of the gradually altered state of an animal through successive generations, is a strong instance of the effect of *condition*; and it is by a regard to this invariable law of Nature, of self-adaptation to circumstances, that the cultivation or improvement of any breed is to be effected. "Hence the most acid and worthless grape is by skillful culture rendered sweet and luscious; flowers without attraction are gradually nurtured into beauty and fragrance; the cat may be made to present all the rich colors of the tortoise-shell, and the pigeon may be 'bred to a feather.'"

Let us now endeavor to deduce a useful, practical conclusion from the foregoing arguments. If our doctrine be correct, the horse-breeder will depend upon the *condition* of the stallion, in order to the procuring of valuable stock from him, as well as upon his other qualities of pedigree, speed, action, bottom, wind, temper, spirit, form, style, size, color, &c.

The next practical question is, how this condition is to be attained, and how the animal is to be kept at the required standard in this respect. The requisite *condition* is only to be attained by *training* for health and strength in a great measure according to the system of training for races: supplying an abundant nourishment of the best quality, allowing sufficient periods of repose for digestion, and giving regular and strong exercise, the whole with such variations as only experience and close observation, under constant practice, can dictate.

The aptitude of an animal to benefit by training is often inherited, like other qualities, from its parentage; and judicious breeding alone can insure a continuance of the desirable quality, or create a propensity for it by proper crossing, when it does not exist in the parents.

The age at which the horse is best adapted to undergo a course of training, is just at the close of his most rapid period of growth, while the system is in its

greatest freshness and vigor. This period is at about five years old. The powers of a horse will augment by suitable treatment in this respect until about the age of nine years: and, in order to obtaining the most valuable stock, a stallion should not be put to service before attaining a full development of his powers, nor kept at it after his form or energies appear to be affected for the worse. He should be, then, between five and fifteen years of age, if of an ordinary constitution; but if of remarkable energy and endurance, and exhibiting no symptom of debility, may be continued until past twenty.

Trainers find their endeavors to produce the highest state of strength, in an animal, greatly impeded by any excitement of the sexual appetite. It is then the more necessary to keep the horse in a state of training throughout the year, impressing most forcibly a tone of health and strength upon his system at the time when his nerves are liable to the least distraction; and continuing the course carefully throughout the season of copulation; never allowing such excess of service, or of the excitement of sexual appetite, as to induce a disturbance of spirit or temper, or a relapse from the most thoroughly strong, healthy and regular tone of the system. G. B.

Contrary to the system laid down by 'G. B.,' and which is urged with plausibility and force, the practice with too many is to keep the stallion through the season, as hogs are kept to carry them to the greatest possible weight in the shortest time, to which end it is deemed best to make them eat as much, and sleep as much as possible. Is it reasonable to expect a vigorous and sprightly offspring from an animal in that condition? The truth is that in the range of a farmer's occupations, there are few things that require more care and consideration and skill than in the department of *breeding his stock*, &c. Yet there are few in which less skill is possessed, or less consideration is exercised. For maintaining animals of various kinds, in their highest form and qualities of excellence, if the truth must be acknowledged, we have not among American husbandmen generally, the practiced judgment, the leisure, the conveniences, or the capital; neither have we the stimulus to close and persevering attention to be produced by the certainty of demand at remunerating prices. Hence the general deterioration which marks the descendants of choice imported animals—unless the Horse be an exception. To him our climate is particularly congenial, and improvement has been maintained by the high prices, still to be had from opulent men in the cities, for superior match horses. Another auspicious influence was that of the *turf*, but that declining almost to extinction, a corresponding effect will be visible after some years on the shape and powers of the Horse. We remember once, at the table of the British Ambassador, to have asked the late J. Randolph, of Roanoke, whether Virginia maintained her ancient superiority in the character of her horses; to which he answered, promptly, "No, Sir, far from it—far from it, Sir. Since we gave up horse-racing and turned up the whites of our eyes, our horses have sadly depreciated."

The Rhubarb.—The leaf of the common garden rhubarb is a fine display of the order of vegetable nature. It is common to find them about two feet square, and containing over 500 square inches. We noticed a lover of Nature examining one a few days ago and making a calculation, the result of which, for its curiosity, we will give. He found that on the surface of the single leaf could be traced more than two miles of distinct canals through which the nourishment passed to give life and vigor to the leaf. These canals being about the sixteenth of an inch apart, divided the leaf into 130,000 fields, each as distinct to the eye as the division by walls of the grass and grain lands of the well cultivated farm. As lateral fibres, more minute than the unaided eye can discover, pass in close contiguity through these small fields, there is no doubt that could all the canals for circulation in a single leaf be extended in one line, they would reach the distance of ten miles.

☞ At the Utica Woolen Factory from 350,000 to 375,100 lbs. of fleece wool are required annually for manufacturing, at a cost generally of about $125,000. The cloth manufactured daily exceeds 450 yards. The quantity of goods sold each year will amount to upward of $300,000, whereas the cost of buildings, machinery, lots, &c., does not exceed $75,000, the whole of the machinery being now in full operation. The wool purchased since 1st June last by the Company, is about 364,000 lbs., costing about $115,000.

HOW SHOULD A CATTLE-SHOW BE REPORTED?

"MANY men of many minds"—some take a lively interest in one department of Cattle-Shows, some in another—though, in our country, it must be confessed, the great mass of people have their eyes and feelings engrossed almost exclusively with the *animals*, and especially the horses. Bring on a goodly number of roaring bulls and fat cattle, and twenty prancing stallions, with the razor-strop man, a live monkey, Gen. Tom Thumb, and a boa-constrictor, and most people go away in *ecstacies* with the *show!*

The very distinguished Editor of the London Agricultural Gazette, Prefessor LINDLEY, seems to have been puzzled to know what to report. His case reminds one of the old man, his son and the ass—which should carry which? As we correspond exactly with the Professor in his opinion, we venture to give what he says:

> The English Agricultural Society hold their annual meeting a month hence at Northampton. Will any kind reader give his adviee as to how their proceedings should be reported? What subjeets should engage most of the reporter's attention? To the report of what should the largest portion of his spaee be devoted? His object on past occasions has been to excite those feelings and to record those facts which the reader would himself have experieneed and aseertained had he been present; and this, however unattainable in perfection, is, of course, the result at which he proposes to aim. But he may err in his judgment of the relative importanee of the many objects there offered to view, and whatever course he adopts he cannot hope to satisfy all. And thus he cannot be wrong in askiug for instruetions before, for the fourth time, he enters upon his task.
>
> This is the more necessary because his last year's report was unsatisfactory to many. The report of the Newcastle meeting was objected to because it referred almost exclusively to the exhibition of implements and to the discussions led by Professor JOHNSTON and Mr. PARKES, and added but little on the show of cattle to the mere premium list, naming those animals which in the opinion of the Society's Judges were the best in the yard. And we have no hesitation in still adhering to our opinion that the *fullest report of the show of live-stock would be of less value to the reader than one of the various implements exhibited, and of the agricultural discussions conducted.* In fact, we have never yet seen a useful report of a Cattle-Show, and should be very glad if some of our readers, before the July meeting, would discuss the question, What points should such a report refer to? What particulars are worthy of a permanent record? To what would allusion be most useful in the ease of readers who had not an opportunity of being present?

For ourselves, those who are personally interested may think we should report all the details—who got the premium, first, second and third, for cows and calves, pigs and poultry; and this might be well enough, if this journal were of local character and circulation; but as its circulation is equally spread over the Union, is it not clear that the space which would be thus filled by details personal and local, may be occupied with matter more generally useful and interesting? Such is the impression under which we act—otherwise nothing would be easier than to cover several pages with lists of premiums. We prefer, however, to give general observations, independent and important, on the general aspect and spirit of such exhibitions. Are we not right? What say you, readers? Where anything original and useful appears in the Reports of Committees, we shall endeavor to give it. There ought to be in such cases a Committee appointed to make a *general report on the exhibition as a whole*, whose duty it should be to say *frankly* and on full consideration, in what departments, as shown in such exhibition, the Agriculture of the State appears to be *improving, retrograding, or stationary*—a sort of *resumé* of the whole. As for the "discussions" referred to by the London Editor, we have none at our Fairs; they don't wind up, in New-York, as in Massachusetts, with a dinner, appropriate

toasts, lively speeches, friendly *carte and tierce*, flashing allusions and sparkling repartee, "the feast of reason and the flow of soul"—such as we used to have at the old Fairs of the Agricultural Society in Maryland, and the brilliant meetings at the Central Course, under the Presidency of Judge HEATH, in the time of that bland, courteous and accomplished gentleman, J. M. SELDEN, in adversity as in prosperity—in look, in feeling, in action—always *the gentleman!* It was in him by nature; it came to him by education; and we rejoice to have a spot on which to hang this portrait of him, poor as it is, and short of doing justice to the original.

CATTLE OF IMPROVED BREEDS.

UNACCOUNTABLE APATHY IN REGARD TO THEM.

FEW things are more remarkable in the agricultural economy of our country than the neglect of cattle-breeders to avail themselves of the use of improved animals, descending from imported stock. Is it ignorance, or is it downright stinginess—that "penny wise, pound foolish" policy which often leads otherwise sensible men *to lose money by saving it?* Nothing was more observable in our late rambles in the mountains of Virginia than the failure of those who breed their own cattle to provide themselves with bulls that would soon give them a race yielding as much beef in three years as they now get in five. Yet so it is, that so lukewarm are cattle-breeders generally that no importer of choice stock can hope for remuneration. The premium bull Marius, at Saratoga, is said to have cost $700 on the wharf in New-York. He was imported from the stock of the late Earl Spencer, one of the wealthiest farmers in all England, and particularly distinguished as a zealous and enlightened Short-Horn breeder. We doubt not that 'Marius' would this day, at a National Fair in England, bring 150 guineas. What they will bring here is attested by the sales of Mr. Prentice and Mr. Gowen, and by the abortion of Mr. Sherwood's attempt to sell. Yet, for any part of our country well adapted to raising and fattening beef-cattle, the get of such bulls as Marius would doubtless give as much beef of the best quality in three years as our best native cattle would in five.

At a late meeting of the YORKSHIRE AGRICULTURAL SOCIETY in England, Mr. John Outhwaite was called on at dinner to give the health of the *successful competitors in the cattle department.* Whereupon he rose and said he

"had pleasure in rising to discharge the duty devolved on him, because he considered that the country at large was greatly indebted to that body of gentlemen he was about to introduce to their notice. And, as a tenant-farmer, he felt that he and those similarly situated ought to hail this toast, for he could assure them that this Society, which had been the means of bringing those gentlemen so prominently before the public as breeders of stock, had also been the medium of great advantage to him as an individual, and he doubted not also to other members of the company then assembled. A few years ago the meeting of this Society was held at Northallerton, and on that occasion two animals (twins) bred by Mr. Lax, of Ravensworth, were exhibited. One of them obtained the first and the other the second prize; and being struck with the perfection of their breed, he and two other tenant-farmers were induced to hire the use of them, and he meant to tell them, as the result, that while they may not be able to beat Mr. Lax, Mr. Booth, or Mr. Bates, still they had improved their stock so greatly by the introduction of those animals upon their farms, that, so far as he was concerned, whereas his father used to hold his bullocks until they were rising four years old, he never kept his more than two years. And further, before they attained the age of two years and six months, they generally averaged sixty stones each, [840 pounds,] and that too without any food beyond the pro-

duce of his own farm—turnips and straw, with perhaps a little bean meal to finish them off in the spring. He believed that the reason why there were not so many cattle exhibited at these meetings as might be expected was that gentlemen were afraid of coming into competition with those individuals who had been so successful upon this and upon other occasions; but although he and others could not boast of being able to compete with them, they could boast and congratulate each other upon the fact that through the improvement which had taken place in the breed of cattle, they could now bring their stock to maturity at an earlier period than they formerly could."

"Mr. Bates, of Kirkleavington, responded, and in the course of his remarks he noticed the history of the breeding of the Short-Horns, and stated that the first Agricultural Society was established in this country in 1732."

We cannot let the occasion pass without noticing the fact that the British agricultural annals fully evince that Mr. VAIL, of Troy, the zealous President of the State Agricultural Society, has gone to one of the most distinguished and successful breeders of Short-Horns in England for his imported stock of that blood. His cows at Auburn and at Saratoga, which bore off the first premiums, were both imported from Mr. Bates, of Kirkleavington, Yarmouth. At the meeting referred to, 150 *sat down to dinner*, and speeches were delivered by Lord Feversham, E. S. Cayley, Sir J. V. B. Johnston, the Earl of Harewood, Lord Morpeth, and others.

Besides their visible and intrinsic excellence, it is saying much for Mr. Vail's cattle that the breeder, not only of his two prize cows, but, we believe, of most if not all that he has of imported stock, took at this great Show lately in Yorkshire—

First prize for the best bull of any age....$150	Second best cow of any age.....$50
Second best yearling bull..... 50	Second best two-year old heifer..... 25
Best heifer calf $50	

Looking back on what has occurred within our own experience and observation, we are sorry to add that the public spirit in the department of improving our cattle has not kept pace with a wider diffusion of agricultural knowledge.

We remember well that some twenty years since, the first three imported in Maryland—bull Champion and heifers Shepherdess and White Rose, sold instantaneously on coming on the ground, for $1,500, and that to a gentleman who, until he saw them, had maintained that England contained no better cattle than his own; and he afterward declared that he considered himself well remunerated for the whole outlay, for the use of the bull for one year on his own farms, of which, however, we believe, he had *fourteen!* and he got $500 for the first calf, Wye Comet, from White Rose.

This early importation into Maryland twenty-five years ago, was made by the present Editor of The Farmers' Library, (then Editor for more than four years of the American Farmer,) with no view but to let the country see what had been actually doing in the way of improving cattle in England, of which his information was derived from correspondence and English journals. He was glad to have them pass, without gain or loss, which he could have but ill afforded, into liberal hands like Governor Lloyd's, who would know how to esteem and cherish them. The following proceedings, which we may be excused for recording as an agreeable reminiscence, historical of the introduction of these splendid animals, will serve to show the light in which such efforts were then regarded by men who have not left behind them their superiors in discernment, liberality and public spirit. Ah! those were good old times, of which we shall call up some farther remembrances in honor of the men and for the good of the cause. *Mem.*—When these cattle sold thus off-hand readily for $1,500, cash, the reader may ask, Ah! but what was the price of produce? The answer is—

June, 1822—Flour...$6 50	Corn....75 cents	Tobacco, fine yellow, $25 to $35; spangled, $18
Wheat.. 1 40	Rye ....68 "	to $25; fine red, $12 to $18; good, $6 to $12.

Extract from the Report of the Committee on Cattle.

The Committee, in concluding their Report, cannot omit to congratulate the Society on the opportunity afforded by the exertions of Mr. J. S. Skinner, of viewing the remarkably fine specimens of this kind of stock recently imported by him, and now exhibited—a young bull and two heifers of the English improved Short-Horned breed. These animals, (not yet two years old,) in the opinion of the Committee, can hardly be spoken of in terms too high, and are a real acquisition to the country. They were bred by Mr. Charles Champion, of Blythe, near Bawtry, in Nottinghamshire, England, and come direct from his hands to Mr. Skinner. They are of great size, fine forms, and combine the very estimable points of aptitude to fatten, and of deep milking; and last, though not the least, that remarkable quiet habit and good temper so much valued by the best breeders, which not only makes it convenient and safe to feed and milk, but which contributes much to the disposition to fatten, and to which, no doubt, may be attributed in a great measure the fine condition in which they now appear, although only little more than a week since they landed from on shipboard.

As in the opinion of the Committee, the Society are alike indebted to Mr. Skinner, for opening a correspondence on this interesting subject with Mr. Champion, a justly celebrated breeder in England, and to the latter gentleman for the entire justice he has done to the expectations of the importer, in the selection of the animals sent him, they beg leave to recommend this successful effort to improve the stock of our country to the special notice of the Society, in such a mode as they may deem best calculated to encourage similar introductions, and to reward the present enterprise.

There were shown also, by Mr. Skinner, a pair of animals of singular character, and heretofore unknown in this country, a bull and cow of the Tuscan breed, said to be fitted in an eminent degree for the yoke. They were selected in Tuscany, and brought to this country last year by Commodore Bainbridge and S. Hambleton, Esq., of the U. S. Navy. Actuated by the laudable desire of contributing to the introduction of useful animals, they ceded them to Mr. Skinner at the original cost, who in the same spirit has disposed of them to Mr. John Middleton, of South Carolina. The Committee will not undertake to determine how far it may prove advantageous in this country to give up in neat cattle the properties usually most sought for, to obtain a breed principally fitted for working-oxen, but for this qualification these animals promise much, particularly as to the Southern States. It is fortunate that they have become the property of a gentleman in that quarter in whose hands the Society may be confident the experiment will be fairly made.

J. MASON,
JOHN HARE POWELL,
I. CHAUNCEY,
JOHN BARNEY,
SAMUEL JACQUES, Jr.
Committee.

After the reading of this Report and the delivery of the premiums awarded by it, the following Resolution was offered by George Calvert, Esq., and unanimously adopted by the Society:

Resolved, That a Committee of three members of this Society be appointed by the President thereof, with authority to procure and present to J. S. Skinner, Esq., three pieces of plate, of the value, one of fifty dollars, and two of twenty-five dollars each, in token of the belief entertained by the Society, of the great improvement in the stock of neat cattle which must result from the importation by him of the bull Champion, and heifers White Rose and Shepherdess, bred by Charles Champion, Esq., of Blythe, near Bawtry, in Nottinghamshire, England.

And General Ridgely, of Hampton, Henry Thompson, Esq., and Doctor Allen Thomas were requested to perform this service in behalf of the Society.

The Resolution was carried out by the procurement of a pitcher of much higher cost, with an engraving of the bull on the front of it, and two beautiful waiters mounted on cow's feet.

OXFORDSHIRE OR IMPROVED COTSWOLD SHEEP.

MR. CLAYTON REYBOLD'S ANNUAL SALE.

The first and as yet the only notice we have seen of this first Annual Exhibition and Sale, we find in the Missouri Republican of Sept. 22.

We know of no hands in the country into which this large and, for certain uses and localities, valuable race of sheep—large in the carcass and proportionately large in the fleece—could have fallen, with greater certainty of being kept up to the mark, than in those of the Reybold family—father and sons—living in the same neighborhood in admirable harmony, with every guaranty for the preservation and improvement of their stock that ample and united means and judgment can confer.

Not doubting that they will adopt the precaution, hitherto too much neglected by American importers of foreign stock, of frequent importations to avoid the bad

effect of close breeding (especially where the chance of selection of breeders is very limited), we doubt not that their stock of sheep will maintain its superiority; and hope for them, what too rarely happens, that their zeal and outlay may be well encouraged and requited.

With some exceptions, the mischievous practice has been to import very superior animals, and then to go on breeding from all their progeny, good and bad, instead of rigidly rejecting all inferior females, and frequently introducing the best males from abroad. It is only by this system that imported stock of any kind can be kept from degenerating, and it is exactly by the neglect of this management that we have witnessed everywhere so much deterioration. Another question arises: Suppose a willingness to be thus cautious and particular—how many of our farmers have the judgment (the result both of zeal and experience) to select the best and to doom all defective animals to the knife? For he who has it at heart that a particular race of animals shall be maintained in their purity, and continue to be esteemed for their peculiar excellence, will refuse to sell as breeders, at any price, such animals as he may himself condemn as defective—because, sooner or later, the stock itself falling into general disrepute, the injury will come back upon himself. There are those—we won't, for we can't, say gentlemen—among farmers who think it a smart thing to put off an inferior animal on a stranger or a friend whom they find not skilled in the points that constitute a good one. Such men belong to and ought to be classed in the category of sharpers and horse-jockeys, who fabricate pedigrees and sell blind horses for sound ones.

At the late Fair at Saratoga we took two gentlemen, strangers, to look at two pens of fine Merino sheep, and asked the men in charge, in both cases, what was the average weight of fleece of the flock from which these sheep had been selected? Taking us, probably, either for the Judges on their rounds, or for very green ones, in both cases they said the average was not less than *seven pounds!* Now the sentiment excited was that of unmitigated disgust, and no purchase would have been made at any price from those who employ such very knowing shepherds or agents. On the other hand, without meaning any invidious comparisons beyond the cases stated, there was a worthy Scotchman, in charge of Mr. McINTIRE's sheep, who answered frankly and honestly to all questions as to his stock, without any mean attempt to disparage any others.

Gentlemen should be attentive to these things, for, trifling as they may seem, they have a bearing on the character of the profession, as well as a local bearing, about which no one can feel indifferent who is animated by that *esprit du corps* which should influence agriculturists as well as other classes.

But our business is with *Mr. Reybold's Annual Sales*—to express the hope and confidence that every precaution will be taken to maintain his flock at the highest mark of improvement, and that he will never allow a diseased or defective animal knowingly to pass from his own into the breeding flock of any one, even through the hands of the butcher—acting, in this respect, on the principle of a certain Maryland breeder of Devons, whom we will not name, but who would sooner give away the best than sell a degenerate and unworthy beast, as a breeder, for any price.

Mr. CLAYTON REYBOLD sold at his farm, near Delaware City, on the 1st of September, a lot of his superior Oxfordshire and Leicester sheep, at the following prices:

No. 1, $61—Maj. Peter, Montgomery County, Md.; No. 2, $44—Mr. Carroll, Baltimore; No. 3, $40—Mr. Gray, Philadelphia; No. 4, $43, and No. 5, $100—Mr. Griscom, New-Jersey; No. 6,

$10—Mr. Hickman, Pa.; No. 7. $43, and No. 8, $41—Mr. Boiling, Va.; No. 9, $45—Mr. Brown, Md.; No. 10, $41—Mr. Jessup, Baltimore; No. 11, $40—Mr. Peyton, Tenn.; and No. 12, $40—Mr. Hall, Sussex, Del.

Mr. REYBOLD was then called upon to put up some of his fine Leicester ewes, eight of which were sold to the following persons:

Lot No. 1, 2 ewes, $28 per head—Mr. Holt, N. C.; Lot No. 2, 2 ewes, $14 per head—Maj. Peter, Md.; Lot No. 3, 2 ewes, $13 per head—Maj. Peter, Md.; Lot No. 4, 2 ewes, $11 per head—Mr. Jessup, Baltimore.

MODERN FACTS, OPINIONS AND PRACTICE.

DRAWN FROM EXPERIENCE; AS DETAILED IN THE BEST ACCOUNTS OF ENGLISH AND SCOTCH HUSBANDRY.

THE winter-feeding of horses in Scotland is hay and oats. The former is given *ad libitum;* in other parts of Scotland oat-straw is given instead of hay. Many judicious farmers think one as economical as the other; but that, with us, must depend on circumstances. There are thousands of farmers south of the Delaware who do not yet grow a pound of hay for winterage. Governor Gilmer of Georgia, yet lively, active and vigorous in mind and body, is the first person who regularly "made hay" in that State.

The raw oats in Scotland are usually *crushed;* and it is considered by experienced, *thinking* farmers, that four bushels of crushed oats will go as far as five uncrushed.

SOILING.—The advantages of soiling are thus forcibly stated in a few, and, in some respects, *new* words, worthy of being noted:

"In the Lothians, where, on almost every farm, some extent of bare fallow has to be tilled during the period intervening between the completion of turnip sowing and the commencement of harvest operations, the work-horses are now generally supplied with *green clover and rye-grass in the stables* or court-yards, which is decidedly a better practice than that of turning the animals afield to graze during the midday rest. When we consider the many advantages accruing from this practice, we feel rather astonished that it is still but partially adopted throughout the kingdom. It is not difficult to conceive the fatigue endured by horses, from being compelled after a forenoon's hard work, to undergo the additional labor necessary in a pasture field, and that probably a bare one too: to satisfy their hunger, not to speak of the annoyance to which they are at the same time subjected from a host of insects; the most troublesome of which are the *horse-fly or clog*, and the *bot-fly;* whereas when supplied in a cool, airy stable or court-yard with clover and rye-grass or vetches, they soon and easily fill themselves, and having thus more time for rest, are fresh and vigorous for the remaining labors of the day.

"Another important advantage arising from the *soiling* of farm horses is that their excrements are thereby preserved, by which a very considerable addition is made to the quantity of home manufactured manure. The dung made in this way is also of the very best quality; the solid and liquid excrements of horses being quickly decomposed in the open air, their most valuable constituents are soon dissipated, and consequently the field droppings produce comparatively little benefit. This objection to grazing does not, however, apply with equal force to black cattle, their excrements being of a colder and less decomposable nature than those of horses; still the value of cattle droppings is greatly diminished by exposure to the sun and wind. But the soiling system is preferable to grazing, not only as affording the animals more time for rest and producing an increased quantity of excellent manure; it also effects a considerable saving of grass or green forage. It is admitted that the cutting and cartage of the forage required by a large number of horses necessarily occasions some labor, which would be avoided by grazing; but this is amply compensated by the improved condition of the horses, and the other advantages above referred as arising from soiling. When a sufficiency of litter is available on the farm, the work-horses may with much advantage be kept in the stables over night, in which cases the evening feed of oats may properly be withheld even though the animals be at hard labor. It has been found in practice that a statute acre of a fair crop of clover and rye-grass suffices for twenty horses during a period of fifteen days, each horse getting as much as he can consume over night and during the midday rest."

There is no doubt to be entertained that an extension of the soiling system will mark the farther progress of economical improvement in American husbandry. If circumstances would admit of its entire substitution for pasturing abroad, it

would be attended, too, with the inestimable advantage to be derived from dispensing with the awful cost of *keeping up cross-fences.*

Expense of Maintaining a Work-Horse.—Among the Scotch, as every one knows, a shrewd, calculating people—the opinion of the best judges is that to maintain a work-horse in proper condition, under ordinary farm labor, he will require each day about fifteen pounds, or two fifths of a bushel, of oats—(Scotch oats, in the general way, are estimated at thirty-eight pounds the bushel.) This, for eleven months' feeding, when actually at work, amounts to five thousand and ten pounds of grain, and as it requires, in the best cultivated part of Scotland, the whole labor of one horse for the *due* cultivation of about twenty-five Scotch acres, equal—let the reader note once for all—to thirty-one and a half statute acres, the horse will thus consume annually about two hundred pounds of grain, for every acre he works, in addition to grass, straw, &c.

Now suppose the case of a man in the South—at least six work-horses for a farm of three hundred acres; he would at this rate require seven hundred and fifty bushels of oats, or their equivalent in corn, in a year. The Yankee saves that by working oxen, which at last *go into his meat tub !*

The Importance of Carbon.

In an interesting work recently published by Jasper W. Rogers, entitled "An Appeal for the Irish Peasantry," the value of carbon in the soil is clearly shown. "In proportion to its proper supply to the culture of all plants, either by the atmosphere or *otherwise*, depends the luxuriance and vigor of their growth."

"Sir Robert Kane gives the following highly valuable Table, showing the amount of carbon in each plant, which he names, viz.:

Wheat	per cent.	46·1	Carbon
Wheat-straw	"	48·4	"
Oats	"	50·7	"
Oat-straw	"	50·1	"
Potatoes	"	44·0	"
Turnips	"	42·9	"
Red-clover hay	"	47·4	"

This, in itself, is sufficient to prove the indispensability of carbon to vegetation.

"It is an absorbent of the highest order, and, used as a fertilizer, it yields to the *roots* of the plant carbon in its purest state, in such quantum as Nature demands."

And if it absorbs moisture, it must also absorb the carbonic acid and ammonia that rain brings with it. There are many other important facts stated in the same work, which should be read by every farmer. And the question is, whether a sufficient quantity is, in all cases, *supplied to the soil*, and that in the most available state for the benefit of the growing plant ?

The Best Time and Method of Sowing Barley.—The barley crop of England is one of immense importance, and is so regarded in the United States, (our crop being 4,161,504 bushels.)

The following will be deemed worthy of attention. The subject has the more interest for us as it seems probable that its culture will be extended to parts of the country where it has not been hitherto cultivated. It was that consideration which prompted us to seek from H. S. Randall, Esq., his valuable Essay, published in the last volume of this journal; and which induces us to give the following opinions, elicited in the course of a recent discussion in an English Farmers' Club.

We may here remark that in July last we witnessed the harvesting of the wheat crop at Montpelier, in Rappahannock County, Virginia; and recollecting the old practice in Maryland, forty years ago, we were very much surprised, after all we had published in the old 'American Farmer' in favor of the practice, to see how very immature a large portion of the crop seemed to be, when cut; but on inquiry of Doctor Thornton, his philosophy seemed to be incontestible, and fully warranted his practice. The reasoning and the application were these: He said, if you cut off your corn just above the ground, when

well glazed, and before it has got *hard and perfectly ripe*, and stook it immediately, the sap will go on to elaborate and perfect its office on the grain, as though the stalk were left standing: and so with wheat—whereas, if you leave either, spread out as it falls, exposed to sun and weather, the whole will immediately *wither*, and the immature grains will shrivel. Hence his people followed *close on the heels* of the scythe-men, to pick up and bind, and shock the wheat immediately. As to wheat, the object is, first to keep it from *shattering*, as it does badly, if left to get dead ripe; and besides, it is agreed by millers that wheat thus early cut makes much better flour. As to Indian corn, the object in early cutting off, is the better to sow down the ground in fall grain. None know until they try, how apparently green grain may be cut if quickly gathered up and otherwise properly cared for.

There is said to be an old saying in Scotland, that "Barley will ripen nine days in the stook."

July 10.—In the absence of Mr. Green, who was to have introduced the subject for the evening's discussion—"On the best time and method of cutting and securing the barley crop," Mr. Hislop volunteered to supply his place, by stating, in the first place, that in his opinion barley, like wheat, ought to be cut before it is fully ripe, not adhering to the old maxim that it ought to be forgotten for a week or ten days after it appears to be ripe. Maltsters certainly differ in their opinion on this head, some saying that when it is reaped before being ripe the malt is apt to be flinty, while others maintain that the barley in that case germinates more freely, and if managed with judgment, produces a superior malt. Mr. Hislop stated that at any rate, according to his experience, the early reaped barley, that is, that which is cut before being *dead* ripe, commands a better price in the market, which he considered a sure criterion of its superiority. The mode of cutting which he recommended was with the scythe provided with a piece of thin board ten inches in hight at the heel of the blade instead of a bow of wood or iron; that the barley should be taken up immediately on being cut, and made up into sheaves of sizes varying according to circumstances; that is, if the weather was unpropitious, or if there should be much young clover on the ground, into small sheaves, and into larger if the weather should be warm and dry, and little or no clover; though as a general rule he should prefer small sheaves. He particularly condemned the practice of allowing the barley to remain in the swath, after being cut, even if overtaken with rain. He then said that in setting up, he generally placed five sheaves, if small, or four, if large, on each side, and hooded them with two others. The plan of hooding he particularly recommended, as he maintained it preserved the color of the barley, and rendered the sample more pleasing to the eye. The stooks, he said, should be set up with the ends north and south. Mr. Bayldon, speaking as a malt-ster, said that he always prefers a bright color in barley. To attain this he recommended that it should be taken up into sheaves and set up into stooks immediately on its being cut, even if the weather should be wet; and stated that he found by experience that the barley which had been so treated, compared with other barley, cut on the same day, which had been allowed to remain in the swath, the former was much easier to malt, and was superior in quality when malted. The system of hooding the stooks he much recommended. With regard to the most advisable time of reaping barley, he should say that in variable weather, let it be cut before being fully ripe; but if the weather should be hot and settled, he thought it better to allow it to remain until it was ripe, but not beyond. He farther observed that a little sweating in the stack he considered to be desirable, as it made the barley germinate better and malt more freely.—Mr. John Wood said he had tried hooding the stocks, and most emphatically recommended the plan, particularly in a wet season. He also said that in his opinion the barley should be taken up immediately on its being cut, and not on any account to lie in the swath. He also recommended that the stooks should not be moved or touched until led away, even in bad weather.—Mr. Charlesworth said he approved of early cutting and of hooding the stooks, and remarked that in his opinion there is more barley spoiled by being allowed to stand too long, than by being cut too early.—Mr. T. Wordsworth expressed the same opinion.—Mr. Hislop here again observed that in Scotland there is an old saying that "barley will ripen nine days in the stook."—Mr. W. Belton gave an instance where in a field of barley, with a thick undergrowth of clover, the part which was taken up immediately produced an excellent sample, and in that part where the barley was allowed to remain in the swath the sample was not nearly so good.—With regard to early cutting, Mr. Briggs remarked that in all sorts of grain, when cut on the verge of being ripe, the skin is thinner and finer than when allowed to remain until dead ripe, and that in the latter case the woody fibre at the exterior of the grain increases, at

the expense of the kernel within. This he considered a provision of Nature, to enable the grain to bear the inclemency of the winter, and to preserve the powers of vegetation from being thereby injured; but at the same time he conceived that that very thickening of the skin might in some degree impair its tendency quickly to vegetate, and that therefore barley reaped just before being ripe, and allowed to complete the ripening process in the sheaf, might reasonably be expected to germinate more speedily, and produce a better malt.

At the conclusion of the discussion, the following Resolution was passed: "That in the opinion of this meeting it is preferable to cut barley before it becomes dead ripe, *particularly in unsettled weather;* to bind in small sheaves *immediately* on its being cut, and set up in stooks, with hoods; also that the raking should not be mixed with the general crop."

THE USE OF BEANS IN FEEDING HORSES.—Americans, prone to experience and change in laws and constitutions, in pursuits and in places of living, are yet a people of routine as to agricultural practice. For instance—while in other countries so many things are used as food for horses and other animals, we go on forever, and without calculation, using the same three or four kinds of diet, no matter what may be their price. We seem to suppose that horses can only be fed on *grass, hay, straw, oats, corn, and chopped rye.* Now in Europe, they feed on *carrots, potatoes, pumpkins, apples, turnips, flax-seed, oil-cake, and not a little on beans and peas.* How many American farmers have ever taken the trouble to ascertain the comparative value of beans and oats; for example: How do they know but in many cases, they might have bean or pea crops, that would give *mere nutriment* for a given cost, and therefore the more economical food? But, alas! to examine such questions it requires the *labor of thought!* and that, to some people, is dreadful to *think of!* To those who do accustom themselves to reflect and inquire, the following suggestions, founded on facts and experience, may appear interesting, and may lead, not only to thinking, but to practical experiments and results, on that very interesting subject of inquiry, *the cost of feeding farm-stock;* in which, (especially when we consider how extensively mules and oxen might take the place of horses,) millions of dollars are wasted in the United States:

August 13.—Mr. Briggs introduced the subject for the evening's discussion—"On the most economical mode of keeping Cart-Horses," by remarking that according to chemical theory (and he believed it would be found correct in practice also) different descriptions of food, both for men and the inferior animals, are nutritive in proportion as, on analysis, they contain nitrogen—that being one of the main ingredients of gluten, which is universally acknowledged to be the most nutritive part of all food; and that the intrinsic value of any kind of food, for the production of muscle and strength, must therefore depend upon the quantum of that constituent (nitrogen) which it possesses. From chemical analysis it is found that the quantity of nitrogen contained in the different articles of food suitable for horses is extremely variable; hence their relative value must also vary in a like proportion. But in the market that criterion is not the regulator of price, and, therefore, by a judicious selection of food Mr. Briggs maintained that much saving might be effected in the cost of keeping horses. He then quoted a Table extracted from M. Boussingault's work on "Rural Economy," in which is given the relative value in nutriment of a great variety of articles of food, taking 100 lbs. of good meadow hay as the standard or basis of calculation; from which it appeared that it required, on the average, 350 lbs. of wheat straw, or 68 lbs. of oats, or 23 lbs. of beans, to yield the same quantum of nutriment as 100 lbs. of hay. A very common allowance for a farming-horse he stated to be, per day, 20 lbs. of hay and 1½ pecks of oats, costing per week—

	s.	d.
140 lbs of hay at 70s. per ton	4	4
10½ pecks of oats at 24 stone (or 136 lbs.) per quarter, say 8 stones at 1s. (equal in value in nutriment to 164 lbs. of hay)	8	0
Per week	12	4

Now, suppose a horse were allowed one bushel of beans, or 63 lbs. of bean meal, per week, it would, according to the Table, be equal in strength of nutriment to about 274 lbs. of hay; and as he calculated that the above method of feeding (with hay and oats,) was equivalent to 304 lbs. of hay alone, an addition of only 30 lbs. of hay, or its equivalent, appeared to be necessary, when 63 lbs. of beans were substituted for eight stones or 112 lbs. of oats. But then again, an animal cannot subsist on condensed food alone, but requires also bulk, not only properly to distend the stomach, but of such a nature as to yield the elements of

carbon consumed during the process of respiration, particularly when that respiration is quickened by continual effort while at work. In order to give that required bulk at the least cost, Mr. Briggs proposed to substitute chopped straw, of which he conceived 25 lbs. per day or 175 lbs. per week would be amply sufficient, which would yield nutriment equal to 50 lbs. of hay. In order to neutralize or counteract the binding nature of beans as food, Mr. B. recommended the addition of 1 lb. per day of crushed linseed; and to show the relative cost of these two methods of feeding horses, he exhibited the following calculation:

	s. d.	s. d.	Equivalent in hay only. lbs. per wk.	
1. Hay per week, 140 lbs. at 70s. per ton	4 4		140	
Oats per week, 10½ pks. or 8 stones at 1s	8 0	12 4	164	304
2. Beans per week, 1 bush. or 63 lbs. at 40s. per qr.	5 0		274	
Straw (chopped) per week, 175 lbs. at 30s. per ton	2 4		50	
Linseed per week, 7 lbs. at 1¼d.	0 9		31	355
Cost of grinding beans, linseed, and chopping straw	1 0			
	9 1			

From which it appeared that the latter method would cost less by 3s. 3d. per week, per horse, and would be more nutritive by the equivalent of 51 lbs. of hay per week.

He farther stated that during the present summer he had tried the experiment of chopping green Italian rye-grass along with chopped straw and bean meal, which, when used soon after being mixed, to prevent fermentation, answered remarkably well, and at little cost. The mixture and cost he stated to be as follows:

	s. d.	Equivalent in hay.
Bean meal per week (8 lbs. per day) 56 lbs at 40s. per qr	4 6	243
Straw (chopped) per week (15 lbs. per day,) 105 lbs. at 30s. per ton	1 5	30
Green Italian rye-grass per week (25 lbs. per day), 175 lbs at 10s. per ton.	0 9½	35
Grinding and chopping, as before	1 0	
	7 8½	308

Being equal in nutriment, theoretically, to the first mentioned mode of feeding, and a little more than one-half the cost. The making use of straw as food he considered as far superior and more economical than converting it into manure by merely being trodden in the folds; and chopping the rye-grass he stated to be also a great saving, from much less waste being incurred. He concluded by stating that if the theory of the relative value of oats and beans, in proportion to the quantity of nitrogen that each contains, be correct, the latter (beans,) must be worth nearly three times as much, weight for weight, in the production of muscle (not fat) as the former (oats), and strongly recommended the members present to give beans to their horses; though to fattening cattle or pigs, he recommended a mixture of the two, in the proportion of two thirds oats to one third beans, the one to produce fat, and the other *muscle* or *lean meat*.

The subsequent Resolution was to the effect that "cart-horses may be kept economically, and in good condition, upon good chopped straw, mixed with about 9 lbs. of bean meal, and 1 lb. of crushed linseed per day."

To the preceding observations, the following may be appropriately added:

In recommending an article for food, it is common to inquire what are its nutritive qualities? According to Einhof, the proportion of nutritive matter in beans, compared with grain, is as follows:

Wheat	74	per cent., about	47	lbs.
Rye	70	..	39	..
Barley	65	..	33	..
Oats	58	..	23	..
Beans	68	..	45	..
Peas	75	..	49	..
French Beans	84	..	54	..

The 84 per cent., nutritive matter of French beans, as above, is made up of pure farina 50, and gluten and mucilage 34 parts; they are, therefore, according to Rham's remark, "superior to every other grain or pulse cultivated, in point of nourishment; and when it is taken into the account that they remain in the ground only from May to September, and that a crop of cabbages or turnips is growing in the intervals at the same time, it will appear that the cultivation of this pulse on a large scale might add greatly to the resources of Agriculture."

There are accounts of the *Windsor Bean*, in England, yielding 11 quarters or 88 bushels to the acre.

A Hint for Directors of Agricultural Societies.—At a meeting of the Royal Agricultural Society of England,

Colonel Challoner gave notice that at the next monthly meeting he should move that it be an instruction from the Council to the Stewards and Judges of the Implement Department, that the following points of information should be ascertained from the respective makers or exhibitors of implements and machines selected for trial, previously to the other arrangements being made for the determination of the respective capabilities and practical value of such implements and machinery, at any particular Country Meeting of the Society, namely:

1. The number of revolutions per minute at

which all hand-instruments are respectively constructed to be worked.

2. The speed per hour at which horses are to walk, and the power they are required to exert, in the case of all implements and machinery intended to be worked by such means.

3. The weight per inch of pressure which all engines or apparatus for steam power are made to bear.

Colonel Challoner explained that his object in this motion is to obtain, for the guidance of the Stewards and Judges of implements, such data as will enable them to place the implements, machines, or engines selected by them for trial, under the special conditions that will best accord with the design of the inventors or improvers of such mechanical arrangements, and especially to limit their operation to that degree of power for which they were respectively constructed.

To some of our readers it may be acceptable to know the COMPARATIVE PRICES of feeding materials for men and beasts, and for the land in England in April, 1846, and April, 1847. It will be seen that Guano keeps up, and that the Peruvian is $10 per ton higher than the Ichaboe.

Lentils, as a new article, are coming into favor as a comparatively cheap and nutritious food for dairy cows.

In Guano, a good deal has been done at last month's rates. Ichaboe of good quality has become very scarce in the large seaports, which is causing Peruvian to be more looked after.

For top-dressing hay and pasture lands, Peruvian has been found, in all trials here, to be infinitely superior to Ichaboe.

DESCRIPTION.	Price in 1846, per ton.		Price in 1847, per ton.		RISE.	
	£	s.	£	s.	£	s.
Oil-Cake	10	10	13	0	2	10
Oil-Cake Meal	10	10	13	0	2	10
Egyptian Beans	8	16	11	4	2	8
Egyptian Bean Meal	9	4	12	8	3	4
Indian Corn	9	4	13	0	3	16
Oatmeal	16	16	24	0	7	4
Lentils			11	0		
Lentil Meal			12	0		
English Beans			14	4		
Dutch Beans			13	16		
Peruvian Guano	10	15	10	15		
Ichaboe Guano	8	15	8	15		
Barrel Flour, per 196 lbs.	1	14	2	0		6
Indian Meal, per 196 lbs.			1	10		

SALT.

IS IT NECESSARY OR USEFUL TO GIVE IT IN THE FOOD OF CATTLE?

A SERIES of experiments, carefully conducted by M. Boussingault, go to show that it is entirely unnecessary, as it is found, on analysis of hay and other food, that Nature herself supplies what is needful. Liebig is of opinion that an excess of salt is injurious to the digestive organs of herbivorous animals. Still we must suppose, from the universality of the practice, that it is necessary and wholesome for cattle *grazing* in fields. This is indicated by the habit of wild animals having recourse to *salt licks;* and all have observed the eagerness of sheep and cattle when called to partake of the salt which is spread for them.

Old negroes, in such cases, are not the worst sources to go to for information; and we recollect inquiring this summer of the herdsman (we are sorry to forget his name) who salts and meals the cattle on the noble domain of that hospitable shoot of a good Irish stock, ANDREW BEIRNE (son of Col. Andrew Beirne, of Monroe Co.), and he promptly replied, "O yes, Master! very good—it makes 'em shed their coat, and keeps the body open."

The experiments referred to are minutely laid down in the September No. of the English Agricultural Magazine.

AGRICULTURAL SURVEYS.

NOTE FROM THE SECRETARY OF THE N. Y. STATE AGRICULTURAL SOCIETY.

It was not until since the New-York State Fair, that the following reached our hands. We beg the writer, unaffectedly, to believe that every sentiment of kindness and every disposition for the interchange of kind offices expressed in it, are cordially and fully reciprocated on our part.

We are delighted to hear of the proposed Agricultural Survey of Washington and other Counties, and that it has been committed to such competent hands.—We heard, too, with pleasure, some indistinct intimation that, as connected with the particular Survey designated, we are likely to have a thorough analysis of *Indian Corn*, in all its parts and periods of growth, to be made by one so adequate to the work and so zealous in the general cause as is the learned Doctor Emmons. When such really useful investigations are thus entered upon, the public will have confidence in the results, and will cheerfully support the Institutions by which they are directed, since they cannot fail to result in (what alone constitutes usefulness in almost everything) valuable additions to the existing stock of knowledge. We have no hesitation in believing that an Agricultural Survey of a single County, well conducted—as we are sure this will be—and embracing everything connected with that branch of industry, will be of more real and lasting benefit than all the State Exhibitions which have been held since the foundation of the Society. We could wish the Society had taken measures to have ascertained the proportion which the fodder of corn bears to the *grain*. We are aware that much depends on the kind of corn and something on the season, but still approximations might be had, highly useful as a matter of agricultural economics.

In regard to the extraordinary and, doubtless, well authenticated crops mentioned in this note, we may be allowed to say that if, along with these accounts, the Society had possessed the means to have analyzed the *soils on which they grew*, and of giving, along with that analysis, the *chemical composition of each of the crops* (which has been ascertained as to wheat and oats, at least), showing how much of their nourishment they derived from the soil—how much from the manure applied to it, and how much from the atmosphere—presenting the whole sum of information at one view—it would have contributed more toward the general production, or approximation to the production, of such crops throughout the State, than all the premiums they distributed for animals at the last Fair. It is by such investigations, and such diffusion of a knowledge of the elements of crops, and the principles on which their successful culture depends, that Agriculture has made such vast strides of late years in Europe, and especially in England, where the average increase in the last quarter of a century has been nearly equal to the total average product per acre in New-York—where there is reason to doubt whether the average *increase* has been one grain!

In relation to the "Transactions of the New-York State Agricultural Society," we have to acknowledge the receipt of the copy referred to, and will take the first leisure moment to examine and review it, with the candor and free-

dom which such performances authorize and invite, and at the same time with all the respect which is due to those under whose direction they are published. In the mean time, as a matter of agricultural history, and of information to which the public is entitled, we would feel obliged to the unfailing politeness of the Secretary to state—the Act of Assembly which authorizes the publication of these Transactions of the State Society—Does it specify the number to be published, and the disposition to be made of them? or leave both to the discretion of whom? Are they to be made up *bona fide* of the "Transactions" of the Society, or may they be composed of any matter, at the discretion of the compilers? and under whose particular direction was the matter designated of which the last volume was composed? What was the whole number published? at what cost per volume? and how have they been disposed of? To these inquiries, connected with a public expenditure for agricultural purposes, it is hoped there can be no objection—while it is due to frankness to state explicitly that so little of public patronage is bestowed on a branch of industry which supports all others, as the tree on which it grows supports the mistletoe, that we feel a jealous anxiety that that little shall be so expended as to achieve the greatest possible augmentation of the agricultural capabilities of the State. This feeling of anxiety has been demonstrated by the labors of not a short lifetime; and being altogether, thank Heaven! unconnected with and far above all alloy of pecuniary or self interest, will not be deemed out of place on this occasion. We should be glad, also, if the Secretary would have the kindness to specify the number of each of the books and publications distributed as premiums by the State Society and the County Societies, designating each work by its title and the cost per copy; and that when foreign editions have been given, the fact and their cost per copy may be stated. It is deemed best and most respectful to make these requests public, as the results are designed for public information, and exclusively for their bearing on the cause and interests of Agriculture. We have no doubt of the liberal interpretation of our views of the excellent Secretary of the Society, and of his co-operation, as far as respects the communication of facts to be ascertained by reference to the archives of the Society.

Before closing this hasty but grateful acknowledgment of the kind offer to furnish us with any information, and the invitation to communicate freely in relation to any matters on which we may desire to be informed, we will take the occasion here at once to say that, according to our humble judgment, the measure which, as we see in this volume of the Transactions, admits the *Ex-Presidents of the Society, ex officio, as acting members of the Executive Committee*, to whom is intrusted the whole administration of the policy, funds and affairs of the Society, *is decidedly wrong and unjustifiable*. It might be well to give them honorary seats and privileges on public occasions, but for an equal participation of government, and control of the proceedings of the Society, is to accumulate power in perpetuity in the same hands, contrary to the spirit in which all our institutions are organized and conducted. We shall, however, maintain our views on this, as on all other questions, most respectfully toward all who differ with us—pitying the narrow-mindedness of all, if any, who can find in an honest and independent difference of opinion, matter for personal umbrage or ill will.

All measures conceived in a high and proper public spirit, as those of this Society, may be presumed to court rather than shun close and respectful criticism. The Secretary of such institutions should be carefully selected and retained, but the direction should be in a certain proportion changed every year,

so as to bring in fresh infusions of spirit and judgment, keeping pace with the progress of improvement, and leaving no opportunity for the formation of cliques or combinations such as might naturally be expected to result from having men appoint their own successors, with power to "hold over" in everything but the name of being President. We speak of the principle, not of the men—*principia non homines*—but it would be in principle just as reasonable to have other Presidents or chief executive officers sitting in council for life. Instead of being members of the Executive Committee, *ex officio*, they should be rendered expressly ineligible.

J. S. SKINNER, Esq. AGRICULTURAL ROOMS, ALBANY, June 10, 1847.

Dear Sir—I send you by to-day's mail the "Albany Evening Journal," which contains a notice of a proposed Survey of Washington County, under the direction of the New-York State Agricultural Society. We are desirous of making progress, and if we can obtain thorough and minute Agricultural Surveys of the several Counties in the State, we shall ascertain the defects of farming—the means necessary to revive and improve the condition of the farmer, and to increase our crops, and adapt them also to soils and locations most congenial.—Dr. ASA FITCH, who has been selected to perform the Survey, is every way well calculated to do the work thoroughly, and I hope much good will result from it.

I have just seen your June No. of the Library, and thank you for the notice of our Premium List, &c. We are ever glad to receive suggestions as to its improvement—our only desire being to make it as perfect as we can, and as liberal as our means will justify.

You make some inquiries, under the head of "Scraps," as to crops reported at a meeting of the Executive Committee of the N. Y. State Agricultural Society. In relation to some of those, the entire crop was shelled and measured after being in a merchantable condition. In the Transactions, which I forward you to-day by express, you will find the statements and proofs as referred to below, viz.:

Charles W. Eels, Kirkland, Oneida Co.—123¼ bushels corn per acre. Vide proofs page 162.

This was a crop raised without any extraordinary application of manure.

Wheat.—Daniel Short, Richmond, Ontario Co.—See statement, p. 593. 178 bushels, 3 pecks, by actual measurement, on 3 1-160 acres of land: 60 bushels per acre, by weight.

The cultivation in ordinary manner.

Oats.—Wm. C. Burrett.—102 bushels per acre, by weight.

The statement accompanying this was duly verified by affidavit and witnesses, as to measurement, land, harvesting, and threshing and measuring crop—grain from entire piece, &c.

Our Societies are requiring, more generally than formerly, the measurement of the entire crop, which is the only true test of the actual yield.

You inquire as to Committees on Agriculture in our Legislature. The Committee in the House of Assembly made a Report on the subject of Agricultural Education, which is published in our Transactions. The Committee in the Senate did not make any Report on the subject of Agriculture. I give you the names of the Committees:

In the Senate—J. B. SMITH, Long Island; J. P. BEEKMAN, Columbia; C. EMMONS, Erie.
In the Assembly—A. BECKWITH, Herkimer; S. LAWRENCE, Tompkins; A. G. VANDERBILT, Dutchess; J. MCGONEGAL, Monroe; WM. TEMPLE, Otsego.

It will give me great pleasure to furnish you with any information which I can give from this quarter, and I hope you will freely communicate with me in relation to any matters you desire information upon here.

I am, respectfully, yours,
BENJ. P. JOHNSON, Secretary N. Y. S. Ag. Soc.

☞ The character of those who are truly wise, when contrasted with the assuming air of the ignorant, may be compared to the different appearances of wheat, which, while its ear is empty, holds up its head proudly; but as soon as it is filled with grain bends modestly down and retires from observation.

GRAIN AND FLOUR TRADE OF THE U. STATES.

The following Table will show the export of bread-stuffs from the United States to Great Britain and Ireland for the year ending Sept. 1, 1847:

From	Flour, bbls.	Corn Meal, bbls.	Wheat, bush.	Corn, bush.
New-York	1,673,582	354,127	2,505.756	6,818,263
Philadelphia	320,950	244,604	539,633	1,127,125
Baltimore	304,263	82,926	101,376	1,687,896
Norfolk	49,687	21,289		1,362,761
New-Orleans	671,335	71,175	818,770	5,186,330
Boston	80,933	25,646	11,541	574,404
Other ports	49,939	47,513	38,058	541.965
Total	3,150,689	847,280	4 015,134	17,298,714

In addition to which, 83,261 bushels of rye, 436,881 of oats, and 239,613 of barley, were exported.

The exports from the city of New-York alone to Great Britain, Ireland, France, and all foreign ports, for the year, were as follows:

	To Great Britain, &c.	France.	All Foreign Ports.
Flour	bbls 1,673,582	243,433	2.154,161
Corn Meal	" 354,127	4.075	415,581
Wheat	bush 2,505,756	352,890	3,085,134
Corn	" 6,818,263	5,772	6,964.952
Rye	" 75.692	104,425	1,007,159
Oats	" 367,791	3,368	416,486
Barley	" 287,503	32	296,208

The following Table, showing the exports of corn, flour and wheat, by months, though differing somewhat in its aggregate from the official figures given above, is still near enough correct to be of interest in illustrating the course of trade during the year:

1846.	Corn. bushels.	Wheat Flour, bbls.	Rye Flour, bbls.	Wheat, bush.
September	117,949	87,195	505	151,765
October	195,182	163,967	953	222,380
November	367,350	115,161	489	303,121
December	245,791	232,894	970	276,758
1847.				
January	411,440	129,825	2,678	160,434
February	814,922	136,313	1,343	149,217
March	1,188,240	77,819	999	82,789
April	1,052,042	100,551	5,629	74,059
May	471,947	111,700	2,938	66,282
June	736,883	342,080	2,965	397,437
July	807,204	420,812	1,238	741,327
August	402,781	189,031	572	305,086
Total	6,811,731	2,107,348	21,279	2,930,655

The total receipts here by the Hudson River from the opening of navigation to the 14th of September last were 2,009,297 bbls. of wheat flour; 94,395 bbls. corn meal; 1,483,400 bushels of wheat; 2,843,841 bushels of corn; and 192.635 bushels of rye.

☞ Glass Milk-Pans are coming more and more into use in Europe. Their advantages on the score of cleanliness must be obvious. It were to be wished that Societies or Institutes would appoint a Standing Committee and put aside a small portion of their ample funds, for the instant importation of sample articles invented abroad connected with agricultural and rural economy. True it is that, in general, this may be left to the vigilance and rivalry of tradesmen and manufacturers; but many years may elapse before we get the benefit of many things which might at once be profitably introduced. The same reason and policy that prompt the offer of premiums for useful things of home invention, would warrant the introduction of things which have been recently invented and patronized by Agricultural Societies abroad. Satisfied that glass milk-pans (on which the manufacturer should indicate the capacity of the vessel) would be a valuable acquisition to our dairy-women, we respectfully suggest the importation of a dozen, and the offer of a premium to the glass manufacturer who shall first produce them in this country, at a cost that will justify their being brought into general use. It has been seen in a very interesting and valuable Essay on "The Management of *Holstein Dairies*," published in The Farmers' Library, that there the dairy-women are allowed $1 a year for "*pan money*," and charged for all they break; yet they always "make by the operation." Let us have *glass milk-pans*.

LECTURES ON BOTANY.*

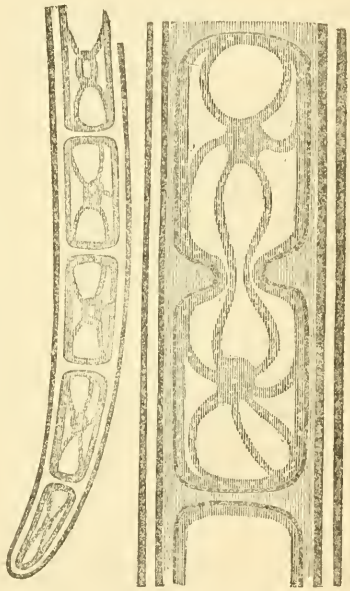
COURSE OF LECTURES ON BOTANY IN REFERENCE TO AGRICULTURE.

By CHARLES JOHNSON, Esq., *Professor of Botany at Guy's Hospital, &c. &c. At Messrs. Nesbits' Agricultural and Scientific Training School, Kennington Lane, Lambeth, near London.*

LECTURE III.

THE operations by which vegetable life and development or growth are maintained, however plausibly set forth by physiologists, and perhaps correctly so in the aggregate, are still, in our present state of knowledge, for the most part incapable of positive demonstration. Their combined effects are seen in the enlargement of parts previously formed and the production of new ones. The leaf opens from the bud, attains its destined size, changes its hue, and falls; the fruit ripens and discharges its seed; the seed grows into a plant, and the same processes are renewed from year to year; but the organs that minister to them are so minute, their mutual action so complicated, that although the external and grosser machinery of life is sufficiently evident, the springs that work it are involved in mystery. The microscope is too limited in its application to effect much toward the elucidation of the phenomena of life. The child breaks his toy to find out the source of the music which his act annihilates; and in like manner the philosopher tears up the organic tissue, or at best deranges its functions, that he may apply his glasses in the vain effort to detect the origin of that which is no longer there; still something is gained by both. The child has perhaps discovered a string that produces a sound when struck, and a little wheel with spokes that might have struck it; while the philosopher has discerned a few facts of which he was previously ignorant; and, in the end, each of them "garring odds and evens meet," and "laying that and that th'gither," find themselves a degree wiser than before. The important fact of the circulation of the blood was discovered and established by a similar series of deductions; and although its passage from the arteries into the veins would be, perhaps, vainly sought by inspection of the minute extremities of those of the higher animals, in the translucent tail of a stickle-back, or the membraneous foot of the frog, the diverging and returning currents are beautifully and obviously displayed. So in plants, although the movements of the sap and other juices cannot be traced in the woody tubes of the higher and more elaborately constructed orders, yet the microscope discovers in the cells of the minute and delicate hairs that grow from their surface, and in those of the leaves and stems of certain aquatic vegetables, comparatively very low in the scale of being, fluids in constant motion, which, with their accompanying phenomena, throw much light upon the process of increase in the tissue to which they belong.

Fig. 1.



In fig. 1 is represented the termination of one of the slender, hair-like aquatic plants, called "conferve;" which consists of little transparent cells, more or less elongated, and joined end to end like a string of beads. In each of these cells the microscope discovers currents of fluid, containing minute particles, moving in the direction of the dotted lines, and apparently circulating from one extremity of the cell to the other, and returning on the opposite side. In the center, or sometimes toward one of the ends of the cell, is a small cluster of particles, from and toward which currents pass in a radiating manner, rendering the combined movements very complicated. The little central mass, however, evidently greatly influences the rotation of the

* Continued from page 121, vol. iii. Monthly Journal of Agriculture.

fluid, and the result is a gradual thickening of the membrane composing the wall of the cell, and likewise an eventual separation of the mass itself, either laterally or longitudinally, into two, each becoming a separate center of motion. The currents thus disturbed, the inner coat of the cell begins to contract between them, as exhibited in the left-hand figure, dividing it into two cavities, which are afterward more or less extended by the force of their respective currents.

Although no apparent connection exists between the cavities of the contiguous cells, careful and repeated observation shows that the movements of the fluids in each influence those of their neighbors, and that a reciprocal action is maintained throughout the whole living fabric. The uniformity of direction preserved by the currents in different cells is in accordance with this latter circumstance, and is beautifully exemplified in the stems and whorled branchlets of the "characeæ," another tribe of aquatic plants, a grade or two higher in the scale of vegetable organization than the "confervæ."

Fig. 2.

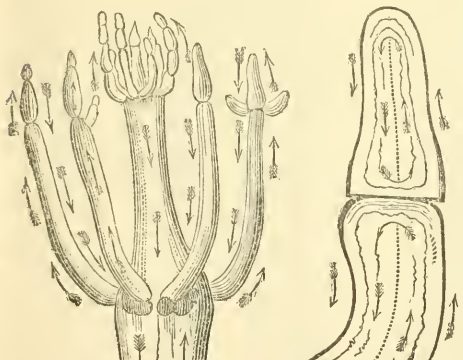


Figure 2 represents a portion of "nitella flexilis," greatly magnified, the arrows marking the course of the internal currents (more distinctly shown in the farther magnified view on the right) of the two terminating cells of one of the branchlets; from inspection of which it will be understood how a complete rotation of the fluid takes place in each cell, passing upward on one side and returning on the other, and that a similarity of movement obtains throughout each whorl of branchlets; the ascending current being toward the outside of the plant, the descending toward the inner or axial side of the whorl. These motions are more or less rapid, according to the season or the temperature under which the examination is made. In the winter time they are scarcely observable.

In what degree the flow of the sap in the higher orders may resemble these curious phenomena, we have not at present the means of ascertaining. The different condition of the woody tubes which contain and conduct it, as compared with that of the cells we have examined, may involve considerable diversity of organic action; and it would be absurd to endeavor to deduce any general conclusions from so very partial an acquaintance with a few isolated facts; the more important and ultimate phenomena of vegetable physiology are yet as much a mystery to human speculation as is the source of life itself.

The relative distribution of the minute elementary organs described in our last Lecture varies in different plants, and, as we shall see hereafter, occasions organic distinctions of high importance to the practical as well as to the merely theoretical student. But under whatever arrangement of the vital channels and recesses the existence and development of the vegetable are maintained, the general process is probably not very dissimilar between the highest and the lowest; the most complicated and the simplest of their structures being rather modified than changed for the required adaptation. The difference between the foodful and the poisonous, in all their degrees of quantity and intensity, are produced by causes which are only secondary or subsidiary to those that regulate the action of the main-springs of vegetable life. In all the higher orders of plants the absorption of nutriment by the root is but a small, however necessary, portion of a complicated process, involving a vast amount of vital and chemical action, whose conjoined effects are witnessed in the production of those secretions that give them character or property and value in the domestic economy of Man. The first elaboration of the absorbed nutriment changes it into *sap*—a fluid possessing nearly the same general characters in all plants, though unquestionably the medium from which their most diversified products are secreted by subsequent modification of its original component principles and (as it would appear in some instances at least) the addition of others. Leaving, however, these latter, and the sources of their derivation, to be discussed at a future period, we will now examine the structure through which the sap is conveyed, and the adaptation of the external organs traversed by its channels to the fulfillment of the changes which it is destined to undergo.

The popular notion respecting the functions of the root are very incorrect, it being generally regarded as the sole medium through which nourishment is conveyed to the plant; while, so far from such being the case, almost every other part presents more or less of an absorbing surface: not, perhaps, in constant or uniform action, but capable of so adapting itself under peculiar circumstances. Some plants, especially those of slow growth and succulent habit, will live

and increase for long and indefinite periods when deprived of root, and apart from the earth in which they naturally vegetate. A socotrine aloe has been suspended in a chamber of my dwelling-house for upward of seven years, and during that time has increased greatly in size, weight, and number of leaves; of which latter organs three or four are developed every year. It is still growing, and as healthy as one of the same kind planted in a pot and kept in a green-house, although its sole source of nutriment must be absorption from the surrounding air through the medium of its leaves. This is no isolated case, but one among many, of a plant growing without roots or perceptible cause of development, simply cited because it has been constantly under my own observation. From it we may understand how possible it is that a vegetable rooted in the soil may still derive much of its subsistence from a different source; nay, that the root may rather even be necessary to secure it a fixed habitat than for its support.

The mode in which the root acts where its assimilating functions are required, and the laws of its development, are circumstances in general little appreciated by those whose daily pursuits are intimately connected with this part of the vegetable economy. The capability of imbibing from the soil seems to be chiefly confined to the extreme ends of the fibres, and hence arises the drooping of plants when they are shifted from one spot to another. How carefully soever the transplantation may be made, the absorbing extremities are broken off in consequence of their adhesion to the soil; or, otherwise, exposure to the dry atmosphere contracts their tender tissue, and renders it for a time, even when replaced in the moist earth, incapable of drawing the necessary supplies.

A section or slice of one of the fibres above alluded to, viewed under the microscope, shows it to consist of a coating of very lax and distended cellular tissue, including a central column of woody tubes and ducts, the outer portion of the tissue having its cells generally much more compressed than those of the interior, somewhat in the manner represented in one of the figures of cellular tissue portrayed in the last Lecture; but the extreme points of the root-fibres never exhibit such contraction of the external vesicles, which appears to take place gradually, as the result of age and the occasional defalcation of moisture in the soil; to compensate for which change the fibres are continually extending in length during the growth of the plant, and thus perpetually present a newly-formed surface of cellular tissue for the absorption of the stimulating and necessary moisture. These extremities are generally thicker than the part of the fibre immediately above them; and, being of a soft, sponge-like texture on the outside, have received the name of "spongioles." It is by not attending to the preservation of the spongioles, or rather from the total ignorance of many practical gardeners and foresters in regard to their existence, that so many trees and shrubs are killed by being transplanted. The spongiole is the growing point as well as the organ of absorption; and, owing to the little care taken in removing the plant, or rather in consequence of the utter carelessness with which it is wrenched from the imperfectly loosened soil, by far the greater number of these little, but important, parts are broken off and left in the ground. Hence probably—nay, we might say certainly—the reason why large trees cannot be successfully transplanted. Growing vigorously, such a tree quickly absorbs all the nutritive matter from the soil in its immediate vicinity, and extends its roots from time to time deeper or more widely distant, to seek the required supply elsewhere, until the growing points of their intricate ramifications are too far removed from the site of its trunk to be preserved during the process of shifting. Obvious, however, as are the absorbent functions of the root, as exemplified by these phenomena, no one who has closely studied the varied structure and physiology of vegetables, and marked the diversified habits and modes of growth that often characterize individuals belonging even to the same natural family, will maintain the popular opinion of its being the universal source of aliment. Among those plants whose vital action cannot be supported without it, even but for a short period, there are various grades in the essentiality of its action as an absorbent organ. This is especially evinced by the different situations in which they vegetate, or are capable of vegetating.

It is not intended by any of the foregoing remarks to deny the important agency of the organ under consideration, but only to direct attention to the fact that such agency may be suspended under peculiar circumstances in certain plants: which, still continuing to live and grow, prove that other organs of assimilation exist, and, existing, are more or less concerned in the maintenance of vegetable life. The most essential of these latter are the leaves, of which only a very small number among the higher orders of plants are destitute; and even these tend by their peculiarity of habit to throw a valuable light on their physiological influence.

In regard to the actual functions of the leaves, opinion has been much divided, but they are now very generally considered to be the lungs or breathing organs of the plant; at the same time it is probable that this function is associated with some others, either uniformly acting or dependent on the influence of external circumstances, as the presence or absence of solar light, the condition or changes of the atmosphere, &c.; and, likewise, that in many instances no inconsiderable proportion of substance is conveyed into the growing plant through their medium.

The anatomical structure of a leaf, and the connection which exists between it and the vessels or veins of the wood and inner surface of the bark, are all calculated to maintain the

important function of respiration—a function upon which seem primarily to depend those modifications of the sap that are essential to the production of the secretions that give so great a diversity of character to different vegetables, and render them available to the various purposes of human economy. Considerable analogy, too, unquestionably exists between the breathing apparatus of plants and animals. In the higher orders of the latter the lungs are almost wholly composed of the ramifications of the bronchial tubes or branchings of the windpipe, and two sets of blood-vessels, called the pulmonary veins and arteries—the ultimate divisions of the three being so minute and intricately blended as almost to baffle the researches of the anatomist, even though assisted by the highest powers of the microscope. The delicate extremities of the air-tubes terminate each in a little rounded cell, over the walls of which branch the almost inconceivably minute extremities of the arteries and veins—the blood circulating in which is thus brought into close contact with the air drawn into the lungs at each inspiration.

It would be foreign to our subject to enter into description or discussion of the physiological phenomena connected with this function in the animal, but it is one apparently essential to all organic beings, however it may be modified in their several grades to accord with their greater or lesser complexity of structure, and their diversified habits and modes of existence. Let us now examine the leaves, and endeavor to ascertain how far the received opinions concerning their respiratory functions are capable of being substantiated by fact.

Viewed apart from the plant on which it grows, the leaf is a very curious and complex structure. A frame of fibre branching from the top of its stalk, or, where the stalk is wanting, from the base of the leaf itself, forming a kind of net-work, the interstices of which are fitted up with a green, soft substance, the whole inclosed within a thin skin or membrane, is all perhaps that the unassisted eye is capable of detecting; but the fibrous frame-work, when magnified, is discovered to consist of the woody and spiral tubes already described, compactly bound together at the lower part, and gradually separating from each other in the form of veins as they extend toward the margins and extremity. The green, pulpy matter occupying the intervals between their ramifications consists of cellular tissue, filled with green particles—its little cells not contiguous throughout, but leaving small open spaces here and there; while the skin-like covering of the leaf *(epidermis)* consists of a layer of small compressed cells, apparently empty or only filled with air, colorless and transparent, so as to admit of the colored veins and green tissue of the interior being visible through them. The skin or *epidermis* varies in texture in the leaves of different plants: as does, likewise, frequently that of the upper and under surfaces of the same leaf. The size and arrangement of the cellules of which it is composed are often very irregular. It possesses considerable rigidity and toughness in some plants, and in all serves to protect the more delicate tissue beneath from external injury. In the greater number of vegetables its continuity is interrupted by pores or openings, technically denominated "stomata," which occur in some cases only on the under surface of the leaf, in others on both sides, and are more or less numerous. Thus, in the leaf of the common lilac, which has none on the upper face, 160,000 have been counted on one square inch of the lower; while in that of the carnation, within the same space, there are 33,500 on each side. The stomates are not mere perforations in the epidermis, but spaces, generally of an oval form, in the middle of which is a slit that opens or closes according to the condition of the atmosphere, or other circumstances affecting the state of the growing plant. The oval border consists, in most instances, of two oblong parallel cells, capable of contracting, so as to become somewhat kidney-shaped, thus opening the stomata; which, so long as they remain straight, are closed.

Fig. 3.

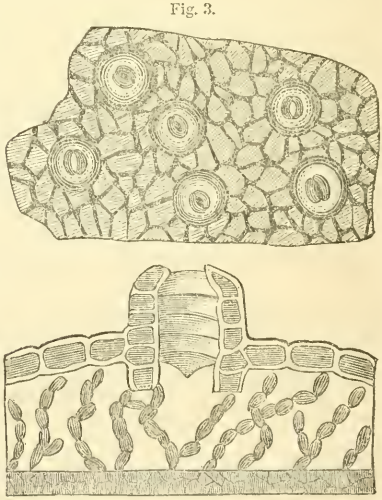
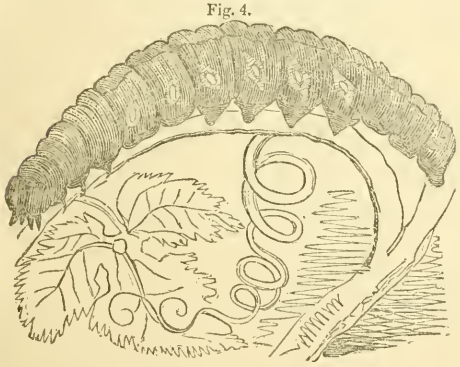


Figure 3 represents a portion of the cuticle of the elk's-horn fern *(acrostichum alcicorne)* highly magnified, with several of its stomata; and at *b* is a vertical section of one of them, showing the vacant spaces into which it opens in the substance of the leaf.

Between these stomates and the spiracles or breathing-pores of some of the lower orders of animals, considerable resemblance unquestionably exists; and numerous experiments (of which our space will not admit any detail) have confirmed the opinions entertained by physiologists concerning their corresponding functions.

It may be difficult for one who has no farther acquaintance with the act of respiration than that derived from his own experience, or from the casual observation of the mode in which it is performed in the few animals of the higher grade with which he is accustomed to associate more or less in the ordinary occupations of his existence, to conceive that such an act can take place otherwise than through the medium of mouth and nostrils; but internal structure is as variable as external form, and involves conditions of life far more diversified than is generally understood. The earth-worm, the spider, the bee and the butterfly are equally dependent upon an alternate inhalation and expiration of the air they move in, as are the man, the quadruped, and the bird; but the process is maintained in a very different manner. The mouth in the former is the vehicle through which food is conveyed into the stomach; but they have no nostrils, and breathing takes place through channels in distant parts of the body. Thus, in the insect, a line of pores is observable on each side of the body, varying in number, but frequently as many as eighteen or twenty, and in certain kinds even many more. They are very evident to the naked eye in many of the larger caterpillars, but in the smaller insects require the assistance of a good magnifying-glass or microscope to discover them. Their position is shown on one of the common cabbage-caterpillars in figure 4. A feather,

Fig. 4.



or a camel's-hair pencil, dipped in oil, and drawn over these two lines of spiracles or pores, kills the insect by suffocation; and if a leaf be rubbed over with oil or varnish, so as to close its stomates, it dies. Hence, indeed, one principal cause why certain plants will not flourish under the shade of trees, while others are not affected by it. In almost all of the latter class that I have examined, the stomates are either wholly wanting on the upper surface of the leaf, or they are comparatively very few in number. Where the stomates are numerous on the upper side, they may become choked by the heavy dripping from the leaves of the tree in wet weather; and, evaporation being checked by its shade, a similar effect is liable to be produced to that arising from the coat of oil or varnish; and I am inclined to believe that this operates as injuriously, or even more so than the obstruction of light, and other causes to which the evil is more generally attributed.

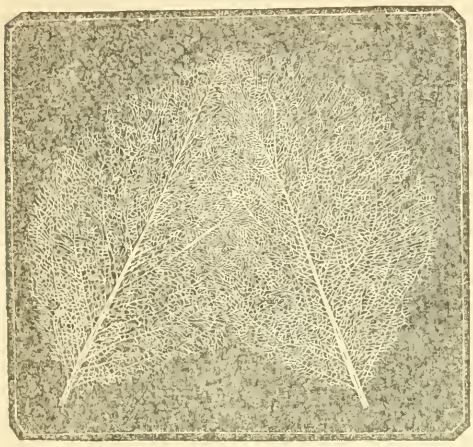
To enable you to appreciate to the desired extent the analogy existing between the respiration of vegetables and animals, a farther examination of the structure of the leaf will be necessary. By maceration, or soaking in water for a few weeks, the decomposition of the softer, cellular portion of the leaf is effected, the skin readily separates, and the pulpy portion occupying the interstices of the veins may be removed by careful washing, leaving the latter entire—they being, in consequence of the greater strength and rigidity of their texture, less liable to decay than the other parts. In this manner the beautiful preparations commonly called the *skeletons* of leaves are obtained; and if the maceration be continued a little longer, the net-work of veins (at first sight apparently simple or consisting of a single series only) divides into two, precisely corresponding with each other, as shown in figure 5. [See next page.]

This curious structure is perhaps more readily ascertainable in the leaf of the common holly than in any other well-known plant, the two sets of veins being less firmly attached than in leaves of thinner substance; but examples of their partial separation may be met with in most damp woods in the spring, among the strata of dead and decaying leaves that then cover the ground. Now, by cutting the stalk of any leaf transversely, and examining the section with a magnifying-glass, you may discern the origin of these veins in two or more masses of fibre; and by carefully cutting through the leaf-stalk, and the stem or branch on which it grows, lengthwise, you may, with the assistance of your glass, trace the connection of one portion of the fibre—namely, that which branches out into the upper net-work of veins—with the woody sheath that encompasses the pith: the other portion, the origin of the lower net-work, passes downward into the "liber," or inner substance of the bark.

This disposition is precisely accordant with the supposed functions of the leaf as an organ of respiration. The sap rises through the woody tubes that surround the pith, forming what is technically called the medullary sheath; and these tubes, branching out into the delicate veins of the upper surface of the leaf, expose it to the action of the air admitted through the medium of the stomates into the internal cavities before described. Whatever may be the nature of this action, which is probably chemical, the properties of the sap are altogether changed by it. From a fluid of comparatively simple character it becomes the depository, in different vegetables, of various proximate principles, of the most com-

plex combinations and energetic qualities; all, indeed, that is hurtful as poison, useful as medicine, valuable in the arts, applicable as food, or otherwise capable of being rendered subservient to human economy, is more or less dependent upon this elaboration of the sap. There are differences of opinion, as previously stated, as to the mode of vital action and the ultimate organization by which these results are effected. Even the theory of vegetable respiration, once considered to be established beyond the possibility of doubt, and supported by numberless experiments apparently the most conclusive, is no longer a settled point in physiology. Some very nice distinctions have been made between the process in question and that of digestion, to which the leaves are likewise subservient; but neither of these operations are sufficiently obvious in the experiments hitherto performed on growing plants to enable us to separate them. By whatever name we designate the source of these modifications of the vegetable juices, and whether we regard it as a simple or a binary process, it is accompanied by a large amount of exhalation. A common sunflower, three feet high, is found to exhale one pound and a quarter of fluid, chiefly water, every day; and the common cabbage nearly as much. This exhalation is ascertained to be chiefly through the medium of the leaves; and, considering their corresponding functions, is analogous to the watery exhalation that accompanies the action of the lungs in animals. That the stomata are concerned in the disposal of this superfluous moisture seems to be very evident, as in succulent plants, and others growing in situations subject to long-continued drouth, these openings are generally very sparingly distributed, while they are most numerous in those that derive large supplies of water from the soil in which they naturally vegetate. Led away by this fact, and contemplating the vast quantity of water exhaled by plants possessing numerous stomata, some physiologists of the present day seem inclined to deny the instrumentality of the latter in the admission of air to the interior substance of the leaf; regarding them only as organs of excretion, like the pores of the animal skin.

Fig. 5.



The reciprocal action of the spiral vessels is no less a subject of dispute than that of the stomata, and on a similar one-sided view of their structure and situation; although no authenticated instances can be adduced of their containing, at any period after their first development in the tissue of the plant, anything but air; and they are for the most part only traceable in those portions upon which these curiously adapted openings exist—so uncertain is our actual knowledge of the phenomena of vegetable growth, and of the vital functions which they indicate! In fact, there is scarcely any branch of physical science so little understood as that of Vegetable Physiology.

By examining the interior of the human body after death, and comparing the relative situations of its various organs with the functions and sensations of the living, we are enabled to decide with a tolerable degree of certainty upon their real agency in the system; and, on dissecting other animals and finding organs in similar situations and bearing similar relations to each other with those of the human body, we are justified in drawing our inferences accordingly. And in this manner, descending from one to another through the various grades of the animal kingdom, we have arrived at a comparatively correct estimation of the grosser elements of their existence; but the organization of vegetables is so perfectly distinct from our own and that of all the higher classes of animals, that it is impossible to draw any correct conclusions by mere comparison. We can, indeed, trace the gradual growth and development of their parts, and observe the loss of vigor and the debility which precedes decay, and from other concomitant circumstances consider them as exceptions to the inertia of matter; in other words, as being endowed with that hitherto incomprehensible principle, *life*. We can proceed a few steps farther by dissection, and, discovering a system of vessels traversing the plant throughout its whole substance, are led to conclude that life here, as in animals, is dependent upon a continually repeated elaboration and modification of the fluids they contain; nay, the microscope shows us those fluids in motion, and almost in the act of depositing the petty molecules that contribute to the growth of the tissue. There we stop. Comparison fails to assist our researches any farther; and experiment, often founded on the uncertain basis of bare conjecture, is our only guide beyond.

A SUBSCRIBER LOST.

A SOURCE of very particular satisfaction to every true spirited conductor of a periodical, must be the belief that its patrons take it for the sake of *reading it*—and yet more, that the more they read it the more interested they become in the pursuit it is intended to illustrate and improve. Deeply should we regret to think that THE FARMERS' LIBRARY was valued only for the *money* it may enable a subscriber to make, by a practical application of some useful recipe, or of some new machine or manure. We have been fondly persuading ourselves that those who take it entertain more enlarged views of their profession, and feel the obligation to become acquainted, not only with the properties and culture of the staples of their own farm, but, that as cultivated men, proud of their calling, they would like to be informed in all the branches of it—both in its practice and its literature: that every gentleman farmer would like, for instance, to have a general acquaintance, at least, with the productions of all the States of his own country, and the nature of the fertilizers and other means employed in their cultivation. How, for example, would any father like to have his son, if asked in Europe what the agricultural staples of South Carolina, or of Maine, or Vermont, answer "I don't know! My business has been raising cattle, and I have never known or inquired whether rice will flourish on uplands, or sheep get the rot on low lands!" Would it follow, because a gentleman cultivates land of virgin and inexhaustible fertility, that therefore he should be content to be ignorant of the action, composition, and effects of *poudrette or of bone manure?* We confess to not much pleasure in laboring for the amusement or benefit of men of such contracted views. True, every honest man must work for his bread, but we take pride in working, with more heart, for higher objects; and while it is highly gratifying to know that with a steadily increasing list of subscribers, *very few* have withdrawn; yet we can hardly hope to retain those who may be so easily lost as the writer of what follows—most respectfully be it said:

"I have read the numbers with some care, and am satisfied that they do not, for many reasons suit the farming interest of South Alabama; we have too much good *wood land* here which can be purchased for $1 25 per acre, to care much about what virtue there is in *bone manure*," &c.

According to the above, we might infer that they only wish to be informed about the best mode of clearing and grubbing new land!

ANNUAL STATEMENT OF THE COTTON TRADE.

CROP.	1846.	1847.
New-Orleans	1,037,144	705,979
Mobile	421,966	323,462
Florida	141,184	127,852
Texas	27,008	8,317
Georgia	194,911	242,789
South Carolina	251,405	350,200
North Carolina	10,637	6,061
Virginia	13,282	13,991
Received overland	3,000	
Total	2,100,537	1,778,651
	1,778,651	
Decrease this year	321,886	

EXPORTS.	1846.	1847.
To Great Britain	1,102,369	830,909
" France	359,703	241,486
" North of Europe	86,692	75,689
" Other foreign ports	118,028	93,138
Total	1,666,792	1,241,222

Showing a decrease of 271,460 bales to Great Britain, 118,217 to France, 11,003 to North

of Europe, and 24,390 to other foreign ports, making the total decrease in the exports for the year ending September 1, 425,570 bales.

The quantity taken for home use during the year amounted to 427,967 bales, being 4,900 bales more than last year.

The quantity of new cotton received at the shipping ports up to the 1st of September amounted to 1,121 bales, against about 200 bales last year.

GROWTH.

Total Crop of	Bales.	*Total Crop of*	Bales.	*Total Crop of*	Bales.	*Total Crop of*	Bales.
1827–8	712,000	1832–3	1,070,438	1837–8	1,801,497	1842–3	2,378,875
1828–9	857,744	1833–4	1,205,394	1838–9	1,360,532	1843–4	2,030,409
1829–30	976,845	1834–5	1,254,358	1839–40	2,177,835	1844–5	2,394,503
1830–1	1,038,848	1835–6	1,360,725	1840–1	1,634,945	1845–6	2,100,537
1831–2	987,477	1836–7	1,422,930	1841–2	1,683,574	1846–7	1,778,651

BARREL MAKING.—The Oswego Times estimates that $260,000 will be paid out this year by the Oswego millers for barrels, the number being from 600,000 to 800,000. The barrels are principally made by machinery, and the Times says in the shop of Mr. Wentworth, his staves are cut and dressed by machinery, propelled by a steam-engine. The staves are cut from the block at the rate of 8000 a day. The steaming process is done by the steam from the engine. After the staves are cut, they are sawed by two buss saws, all of one length, and then dressed and jointed in a very expeditious manner on a large wheel, into which knives are inserted. The stave is then fit for use. Six men will cut and dress 8000 in a day. In another shop the barrels are put together. The establishment turns out from 1000 to 1500 barrels weekly, and gives employment to about 35 workmen.

☞ Mr. RANDALL's Letters on "*Sheep Husbandry in the South*" will be continued in our next issue.

PRICES CURRENT.

[*Corrected, October 23, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47 .℔ 100 lb.	6 50	@	—
Pearls, 1st sort, '47	8 —	@	—
BEESWAX—American Yellow	— 24	@	25
CANDLES—Mould, Tallow..℔ lb	— 12½	@	14
Sperm	— 31	@	33
COTTON—From..℔ lb.	— 8½	@	10¾
COTTON BAGGING—Kentucky	— 15½	@	16
CORDAGE—American..℔ lb.	— 11	@	12
DOMESTIC GOODS—Shirtings,℔ y.	— 5	@	11
Sheetings	— 6¼	@	15
FEATHERS—American, live	— 28	@	33
FLAX—American	— 8	@	8½
FLOUR & MEAL—Genesee, new, bbl.	6 62½	@	—
Oswego, new	6 50	@	6 56½
Michigan, new	6 50	@	6 56½
Ohio, new	6 50	@	6 56½
Ohio, Round Hoop	— —	@	—
Ohio, via New-Orleans	— —	@	—
Pennsylvania	— —	@	—
Brandywine	6 75	@	—
Georgetown	6 62½	@	6 75
Baltimore City Mills	6 62½	@	6 75
Richmond City Mills	— —	@	—
Richmond Country	6 62½	@	6 75
Alexandria, Petersburg, &c	6 62½	@	6 75
Rye Flour	5 —	@	—
Corn Meal, Western and State	3 —	@	3 25
Corn Meal, Jersey and Brandywine	3 50	@	3 75
GRAIN—Wheat, White....℔ bush.	1 40	@	1 47½
Wheat, Red and mixed	1 10	@	1 37½
Rye, Northern	— 90	@	92
Corn, Jersey and Northern yel	— 75	@	—
Corn, Southern, yellow	— 75	@	—
Corn, Western, yellow	— 75	@	—
Oats, Northern	— 48	@	—
Oats, Southern, new	— —	@	—
HAY—North River in bales, ℔100 lb	— 58	@	60
HEMP—American, dew-rotted..ton	140	@	150 —
" " water-rotted	200	@	250 —
HOPS—1847	— 8	@	10½
IRON—American Pig, No 1	35 —	@	37 50
" Common	27 50	@	30 —
LIME—Thomaston..℔ bbl.	— 75	@	— —
LUMBER—Boards, N.R., ℔M. ft. clr.	35 —	@	40—
Boards, Eastern Pine	— —	@	— —
Boards, Albany Pine..℔pce.	— 12	@	21
Plank, Georgia Y. Pine. ℔ M. ft.	27 50	@	— —
Staves, White Oak, pipe.℔ M	50 —	@	— —
Staves, White Oak, hhd	40 —	@	— —
Staves, White Oak, bbl	30 —	@	— —
Staves, Red Oak, hhd	24 —	@	28 —
Hoops	20 —	@	30 —
Scantling, Eastern	16 25	@	22 50
Scantling, Oak	30 —	@	35 —
Timber, Oak..℔ cubic foot	— 25	@	— 30
Timber, White Pine	— 18	@	— 25
Timber, Georgia Yellow Pine	— 28	@	— 32
Shingles..℔ bunch	1 75	@	2 25
Shingles, Cedar, 3 feet, 1st quality.	26 —	@	30 —
Shingles, Cedar, 3 feet, 2d quality.	24 —	@	28 —
Shingles, Cedar, 2 feet, 1st quality.	18 —	@	22 —
Shingles, Cedar, 2 feet, 2d quality.	16 —	@	20 —
Shingles, Cypress, 2 feet	15 —	@	18 —
Shingles, Company	35 —	@	38 —
MUSTARD—American	— —	@	— —
NAILS—Wrought, 6d to 20d..℔ lb.	— 10	@	— 14
Cut 4d to 40d	— 4¾	@	— 4½
PLASTER PARIS—℔ ton	2 37½	@	2 50
PROVISIONS—Beef, Mess, ℔ bbl	10 —	@	11 —
Beef, Prime	7 —	@	7 50
Pork, Mess, Ohio	15 —	@	— —
Pork, Prime, Ohio	10 50	@	10 75
Lard, Ohio..℔ lb.	— 10	@	— 11½
Hams, Pickled	— 7	@	— 8½
Shoulders, Pickled	— 6½	@	— 6¾
Sides, Pickled	— —	@	— —
Beef, Smoked..℔ lb.	— 10½	@	— —
Butter, Orange County Dairy	— 19	@	— 20
Butter, Western Dairy	— 16	@	— 18
Butter, Grease	— —	@	— —
Cheese	— 6¾	@	— 7½
SEEDS—Clover..℔ lb.	— 7	@	— 7⅞
Timothy..℔ tierce	14 —	@	16 —
Flax, Rough	— —	@	— —
SOAP—New-York..℔ lb.	— 4	@	— 7
TALLOW—American Rendered	— —	@	— 10
TOBACCO—Virginia..@ lb.	— 2¾	@	— 6½
North Carolina	— —	@	— —
Kentucky and Missouri	— 4	@	— 7½
WOOL.—Am. Saxony, Fleece..℔ lb.	— 45	@	— 50
American Full Blood Merino	— 38	@	— 40
American ½ and ¾ Merino	— 33	@	— 36
American Native and ¼ Merino	— 28	@	— 30
Superfine, Pulled Country	— 33	@	— 35

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THE STATE OF NEW-YORK:

ITS EXTENT AND AGRICULTURAL PRODUCE, WITH OTHER STATISTICS, AND EDITORIAL REFLECTIONS SUGGESTED BY A VIEW OF THEM.

Here, again, it may be alleged that there is nothing "practical"—by which is usually meant, nothing *exactly and directly money-making*—in the knowledge to be derived from a view of such facts as these; yet what intelligent reader, imbued with a spark of that State pride which is the beginning of patriotism, does not wish that provision could be made for ascertaining, in like manner, the resources and productive power of the State to which he belongs? What young lad should leave school, indeed, without having even *there* become familiar with such facts, as far as the means exist for learning them? How much more "practical," even, would it be to be made thus acquainted with the sources of wealth existing in every part of his own country; and how much in each State is the aggregate amount, and average acreable produce of all its great staples, than to be learning, parrot-like, by rote, the speeches of savage or civilized warriors before or since the Flood, as they are taught in our country schools? How—yet more emphatically may we demand—can enlightened legislation be enacted for any State, without such knowledge of her natural and artificial capabilities, and the progress making for their development? Alas! in the scuffles of party for power, and the watchfulness of demagogues who stand ready to use it, when acquired, for selfish and party ends, the great, substantial interests of the community, and all the great and legitimate purposes of enlightened government, are too often lost sight of.

In Hunt's invaluable Magazine, where the facts contained in the Census of the Federal and State Governments have been clearly tabularized, it is well said in some preliminary remarks that "the earth is the fruitful mother of the other great industrial interests of the State; and the products of Agriculture furnish the manufactures with the raw material out of which the skill and industry of the artisan produce the 'goods, wares and merchandise' that supply Commerce with its commodities of traffic and transport."

From the United States in 1846, the agricultural exports amounted in value to $78,673,515, while that of all besides, united—of the sea, the forests, wood in all shapes, as staves, masts and spars; naval stores, pot and pearl ashes, and manufactures of every kind—in short, the produce of every other branch of industry—amounted only to $22,468,378, being about $4 of national wealth produced by the plow, to $1 from *all* other employments. Yet who ever heard of

any special legislation for the benefit of the farmer? Even *madder* for the manufacturer, which might so easily be produced in many of our States under a small duty, is let in a manner to benefit the landlords of the half starved laborers of Europe who work for nothing, and are then, generally, not half as well fed, clothed or housed as the slaves of the United States. We have munificent and well bestowed national expenditures for instruction in the use of *fire*-arms, but who ever hears of our Government providing for instruction in the use of the arms and implements of husbandry? Now let us suppose that in New-York, at Hyde-park or elsewhere, removed from the interruptions, the temptations and seductions of a large city, New-York had possessed for an equal time a school with its buildings, Professors, apparatus, and repositories, and libraries, to rear up and send forth instructors over the country, in all the principles of Agriculture; may we not suppose that it would have added as much to the agricultural capabilities of the country as the West Point Academy has added to the efficiency of our Army, in the practice of war? Alas! the day is yet too distant when her farmers will have the discernment to perceive, combined with the spirit to demand, the former as being at least as necessary and useful as the latter. But let us proceed, and we shall see the interest at stake and the ground that landholders have to insist that Agriculture shall occupy the foremost instead of the rear rank among objects of Government care.

The area of New-York is 29,220,936 acres; population 2,604,495, springing, with additions by immigration, from only 100,000 in 1749. Of this amazing increase, 1,000,000 has accrued in the last 25 years; and much of the impetus under which this increase has taken place flows from the *internal works* that connect her great Atlantic emporium, with the lakes and canals of the growing West. How much will that impetus be augmented when the *Erie Railroad* shall have been completed? There are some striking facts that here present themselves for the contemplation of legislators, or rather of statesmen—for unfortunately these are by no means convertible terms. When the first regular Census was taken in 1790, the population of Virginia was 748,308; that of New-York only 340,120. In a race of twenty years, which is but a "brush" in the race of States, New-York had already lapped her, having in 1810 gone up to 959,049, while Virginia stood at 974,622. In the next twenty, after she began to wax fat and grow strong in the enjoyment of her internal improvement policy, without any aid from Hercules, (though she called on him,) she beat the Old Dominion by more than a million! Virginia standing, in 1840, at 1,239,797; New-York 2,428,921—since which she has added nearly 200,000 more, besides doing much toward colonizing Michigan and other Western States. To how many States might be applied the remarks of Hon. J. R. Poinsett, of South Carolina, where, contrasting the condition of Flanders and Sicily, from personal observation, he says: "In Flanders the whole country bears the impression of the vivifying industry and zealous enterprise of the people. It is traversed in every direction, by lines of easy communication, furnished with manufactures in every town and every hamlet, to work up the product of its agricultural industry, providing the farmer with an abundant home market, while affording employment to a large portion of the population; wasting nothing, but working up and extracting valuable materials, which are considered in some countries as worthless refuse. Whereas, Sicily, with its fine climate and fruitful soil, bears the impress of slothfulness and neglect. No roads, no canals, none but the coarsest manufactures, the land carelessly tilled, and yielding a scanty subsist-

ence to the laborer."—But what, says the impatient "practical man," has this to do with Agriculture? Why, *only* that it shows how Agriculture thrives and subsistence is augmented, and with it population, when roads and canals provide easy transportation to market, and save for direct production the labor that had been employed in exchanging. The saying is imputed, we believe, to the late Nathaniel Macon, that he would not like to live in a State where the population was so dense that any farmer could "hear his neighbor's dog bark;" and we can believe it, as he once told us himself that he would not live where there was a *law against dogs!* "Each of my negroes keeps one, and I keep thirteen," said he. But where would this country have been if all had been, like him, advocates of the stand-still policy? Hence has it, in part, happened with his State, North Carolina, that with an area of 26,832,960 acres, within a fraction of New-York, she has only one-third the population; and (speaking of dog laws) she has 538,279 *sheep* against 5,118,777 in New-York—so stood the account in 1840. New-York had, two years since, increased her flocks to 5,443,855. How much has North Carolina increased hers in the same time, with every negro his dog, and every master his thirteen? New-York clipped, in 1845, of wool, 13,864,828 lbs., which at 33 cents a pound was worth $4,621,602!! Let us here ask, as not inapposite to the subject in hand, how many farmers in North Carolina have read the very able and conclusive letters by H. S. Randall, now appearing in The Farmers' Library, *demonstrative* of the resources and capacity of the Southern States for successful Sheep Husbandry? We pray you, reader, is there not something of a "practical" aspect in this view of the question? But again, as to the practical advantages of a populous over a sparsely settled State, if each enjoyed an isolated, independent existence, not united under one government, with power according to population, we are not sure that we, too, would not prefer for personal comfort a thin settlement, where one could barely hear the shrill note of his next neighbor's old gander in a clear, frosty night, or just see the smoke from his chimney rising over intervening woods and hills at daylight in the morning. But be it remembered that ours is a *law*-manufacturing country, and more than half the year is spent in making new laws and tinkering those that are not yet old; and when the conflict of local interests and local policy, likely, unfortunately, to be more and more inveterate—when that comes on in the halls of legislation, *does not population tell?* Besides, the *law* of Nature is that with prosperous and increasing population, all industries thrive, all arts improve, and the sources of comfort and happiness multiply.

But we are rambling into views of the subject of political power and resources, which we did not here propose to touch; nevertheless, we have it in contemplation to give, as far as materials offer, similar sketches of the agricultural condition of all the States, as they will present facts connected with the husbandry and politico-agricultural power of each, with which every young man ought to be familiar; and we shall persist in writing for *them*, whether their fathers choose, or not, to let them see what we offer. In fact, we mean (thanks to the liberality of our Publishers, and our abundance of materials!) to present such matter for the benefit and instruction of the rising school of American husbandmen, as must force its own way, whether channels are opened for it or not.—Those who don't take The Farmers' Library now, will have to go back for it by-and-by, when the amount will tell, besides losing the benefit in the mean time for themselves and their sons. But preliminary to an exhibition of the agricultural resources and products of the State of New-York, it occurs to us to make one other remark, for the benefit of those of the stand-still school, who

would contend that there is no room to hope for material advancement in Agriculture. Let us look at these *averages*, and compare that of even the highest in any county in the State—Monroe, 19½ bushels of wheat—with what it has been *proved can be made;* and so of other crops. The average of the whole State, it will be seen, is *under* 14 of wheat, 26 of oats, and 25 of Indian corn.—Now it has been seen, in the last number of THE FARMERS' LIBRARY, in a letter to the Editor from the efficient Secretary of the State Society, that Charles W. Eels, of Oneida County, "without any extraordinary application of manure," made 123½ bushels of *corn* to the acre; that Daniel Short, of Ontario, made 60 bushels of *wheat* to the acre, by weight; and that W. C. Burrett made of *oats* 102 bushels to the acre, by weight. In England, the average produce of wheat is 25 to the acre, instead of 17 in 1821, and less than 10 a century ago. And how, reader, do you suppose it has been accomplished? According to the most distinguished men in the kingdom—tenant farmers as well as landlords—it has been brought about by a more thorough *knowledge of the principles* on which success in Agriculture, as in every other art in the world, depends! But do you expect Congress to do anything for diffusing light upon the poor, humble business which is made to prosper by a better knowledge of the *component parts of the soil, and of manures, and of plants—of geology, of physiology and entomology,* or any other art except *gun and pistol and sword-ology?* Not they! Our beneficent Government, established by "we the people" for the people's good, has no power of action for the benefit of the *bread-making art, or the art of making sugar, or rice, or cotton.* True, the Government has exercised the power to analyze *cotton*—not in its agricultural or any other relations, but to see whether it might not take the place of that "villainous compound," *gunpowder!* True, they do exercise the power of establishing a bureau or university for the dissemination of agricultural knowledge—but only in a sneaking, left-handed way. In certain pigeon-holes of a subordinate Bureau of the State Department, labeled Hogs—Sheep—Dairy—Potato Rot—Bees—Indigo—Broccoli—Bene Plant—Hemp—Hay—Onions, &c. &c., scraps are collected, and letters filed, which once a year are made up into books, to be given away by Members of Congress to favored constituents; and this it is which takes the place of Washington's "Agricultural Department," and passes at home, and unfortunately abroad, for *our* national patronage of the great art and business of American Agriculture—our national exposition of the condition and resources of the landed interest of this great and growing country—such a Report as Lyford, of Baltimore, would cut out and more lucidly make up in a month, from the exchange papers of any daily paper. Why not, as they do swallow the principle, take hold of the subject at once, in a manner worthy of its dignity, and its transcendent importance—paramount as it is, and as it deserves to stand before all others? Why not, while they are expending the public money for disseminating knowledge, (for if it be not for that, for what is it?) at once establish an institution like that at West Point, for *rearing up instructors,* who shall go forth, throughout the State, to spread far and wide a knowledge of chemistry, geology, botany, physiology, and mechanical philosophy, as *connected with that art which forms the business of four-fifths of the people, and which feeds all classes?*

1. *Statistics of Wheat, Rye and Oats.*

Acres of improved land in the State	11,737,276	No. of acres of *oats* sown	1,026,915
No. of acres of *wheat* sown	1,013,665	No. of bushels of oats harvested	26,323,051
No. of acres of wheat harvested	998,233	Average No. of bushels per acre	26
Quantity of wheat raised....bushels	13,391,770	No. of acres of *rye* sown	317,099
Average No. of bushels per acre	14	No. of bushels of rye harvested	2,966,322

Average No. of bushels of rye per acre.....9½

2. *Corn, Potatoes, Peas and Beans.*

No. of acres of *corn* sown	595,134	No. of acres of *peas* under cultivation	117,379
No. of bushels of corn harvested	14,722,114	No. of bushels of peas raised	1,761,503
Average No. of bushels per acre	25	Average No. of bushels per acre	15
No. of acres of *potatoes*	255,762	No. of acres of *beans*	16,231
Quantity of potatoes raised	23,053,418	Quantity of beans raised	162,187
Average No. of bushels per acre	90	Average No. of bushels per acre	10

3. *Barley, Buckwheat, Turnips and Flax.*

No. of acres of *barley* cultivated	192,504	No. of acres of *turnips* cultivated	15,322
Quantity barley raised preceding yr.	3,108,705	Quantity of turnips raised	1,350,332
Average No. of bushels per acre	16	Average No. of bushels per acre	88
No. of acres of *buckwheat*	255,495	No. of acres of *flax* cultivated	46,089
Quantity of buckwheat raised	3,634,679	No. of pounds of flax raised	2,897,062
Average No. of bushels per acre	14	Average No. of pounds per acre	100

4. *Neat Cattle, Horses and Hogs—Butter and Cheese.*

No. of *neat cattle*	2,072,330	Pounds *butter* made during the year	79,501,733
No. of neat cattle under 1 year old	334,456	Pounds *cheese* made during the year	36,744,976
No. of neat cattle over 1 year old	1,709,479	No. of *horses*	505,155
No. of cows milked	999,490	No. of *hogs*	1,584,344

5. *Sheep, Wool, Fleeces—Agricultural Statistics.*

No. of *sheep*	6,443,855	Average No. of pounds per fleece	3
No. of sheep under 1 year old	1,870,728	No. of farmers and agriculturists	253,292
No. of sheep over 1 year old	4,505,369	Legal voters	539,379
No. of *fleeces*	4,607,012	Total population	2,604,495
No. of pounds of wool	13,864,828	Proportion of farmers and agriculturists	1 to 10

HOGS—BACON.

REMARKS ON VARIOUS BREEDS OF HOGS, AND HOW TO INSURE THE BEST BACON.

HOMELY subjects these, saith the reader; yet not to be despised in this utilitarian age of ours. Nay, the time was when even *brawn*, which, according to old Sam, means *boar's-flesh*, was reckoned a great delicacy; nor was he altered or slaughtered until all his faculties were fully developed, and age had imparted to his flesh that firm consistency and high flavor which seem to have suited the palate of our Saxon ancestors. An ancient writer of renown says: "The proper age of the boar is from two to five years old, at which time it is best to geld him or sell him for *brawn*;" and Johnson defines a brawner to be "a *boar* killed for the table."

> "At Christmas time, be careful of your fame;
> See the old tenant's table be the same;
> Then, if you would, send up the brawner head—
> Sweet rosemary and bays around it spread."

We are, in fact, told that the boar's head soused, in the days of the peg and wassail (corrupted into pig and whistle), was the first dish on Christmas day, and was carried up to the principal table in the hall with great state and solemnity. In 1170, (says Hollingshed,) Henry I., on the day of the young Prince's coronation, served his son at the table, as sewer, or head waiting-man—bringing up the boar's head, with trumpets before it, according to the fashion of that day. But what changes do our tastes and habits undergo with the progress of wealth and luxury! What, we wonder, would have prevailed with the worthy and lamented "*Ben Ford*," of Baltimore, to place a five-year old boar's head at the head of one of his dinner tables? Why, his very bones would turn in his grave at the bare thought of it. *Alas, poor Ben!* shall your name be written in such connection, without one line of grateful tribute to you and to your old contemporary, *Chamillon*, the French cook, from the pen of one for whom you so often and so

well cooked and served up the good things of this life, though he be now among the poorest of your friends? As great *artistes* in your lines respectively, who denies your genius?

"The cook and sewer each his talent tries;
In various figures scenes of dishes rise."

If, indeed, honor arise from well acting our parts, who better performed his part, or who was better pleased to serve the "quality," than Ben? How many of the "old set" will agree with us that we could better have spared many a whiter man? For one, we hope never to be ashamed to do justice to honesty and excellence, displayed by whatever color, in whatever sphere of life.

As, however, returning to our subject, we have no ambition to taste head or tail of a five-year old brawner, we come down to later times, and, as the reader will agree, to better eating.

We have now been residing in New-York, *nolens volens*, since the day, memorable in the annals of the turf, when *Peytona* beat *Fashion*, the latter being out of condition, in two straight heats of four miles; and we can safely say that, in all that time, we have never seen a real red, juicy, right-sized, well-shaped, high-flavored, properly smoked, corn-fed *ham*—neither too salt nor too fresh, but just the right thing!—one of which it might be truly said, "the nearer the bone, the sweeter the meat"—such as one meets with, almost universally, on the tables of the respectable middling farmers in Maryland, Virginia, North Carolina, Kentucky, and, we suppose, Tennessee—and especially, if we must say it, according to our personal experience, those of Montgomery County, Maryland, where hams possess an indefinable richness, if we may so say—a *leetle* better than is generally to be met with even in the States named, where bad bacon is as rarely to be found as a really high-flavored, choice ham north of the Hudson.

Reared in the country, and in the very region of persimons, acorns, beech-nuts, and hickory-nuts, and chestnuts, and Indian corn—where hogs run and root, enjoying, by universal suffrage, the "largest liberty," until they are "put up" in October to be fattened—we may, without presumption, undertake to tell the *how* of good bacon, and the *why* it is that he who would have it of a quality that prompts you to scrape the bone for the last particle to be got of an old ham, may never expect to meet with it, except by purchase, either from Westphalia, or from the region of *Indian corn, large farms and open ranges* in our own country. In what we have here undertaken, the obvious course would be to descant somewhat on the various breeds of hogs, as on this the size of the animal and his habits, his physical capacity, the quality of his meat depend. Some, especially the large breeds, have thick skins and a coarse grain of meat, while others have thin skins, with a more delicate and juicy fibre. Of this last description we should be disposed to rank the Spanish black hog, such as was introduced more than twenty-five years ago, by that "fine old Commodore" and natural gentleman, *Commodore Chauncey*—as a great number of very valuable things, indeed, were introduced, about that time, by our old officers of the Navy; many more than the public have any idea of now, but of which, being at the time, more than any one else, personally cognizant, it will be our grateful pleasure, some of these days, to render an account.

The Spanish hog brought by Commodore Chauncey was, if we mistake not (the original or the progeny), presented to the late *Robert Smith*, formerly Secretary of the Navy, and President of the Maryland State Agricultural Society, and, in all places and positions, the gallant and accomplished gentleman. In England they reckon not less than twenty breeds, or breeds under twenty names.

For a hog to make good bacon, we should certainly *not* go, for instance, to Boston for the breed of Amos Wood's sow, that weighed alive in 1819 only 1106 pounds, having gained 510 pounds in 365 days. Yet Agricultural Societies continue to offer premiums for *large hogs*, as if they expected thereby to develop some new principle in swine-ology. For those who go for weight, it may be proper to add that Mr. Wood gave his sow a *salt fish*, and the water in which it was boiled, once a week. *Buffon* mentions a hog killed in England which weighed 853 pounds; *Sonnini*, his commentator, another, killed in France, which weighed 990; and *Mr. Jefferson*, in his notes, mentions one killed in Virginia that reached the enormous weight of 1200 pounds.

But, on reflection, we must defer to a more convenient season our observations on the breed and management of hogs, as it would, of itself, make a paper for all the space we can spare. Moreover, it is *now* too late to give advice as to *breeds;* for the time is nearly at hand for the farmer to kill such as he has; and for those who put up their own meat to buy the best they can get. Our own impression is, however, that among the best breeds ever imported for the region of good bacon, before described, were the hogs sent to this country by a Mr. Wright, an English farmer, to Mr. Skinner, then Editor of the American Farmer. They were a long, well proportioned, neatly formed, black hog—if anything, rather large. They got into great repute in Virginia, and were there called the "Skinner breed," in the neighborhood of Richmond, on the James River. Mr. George Patterson, of Springfield, is said to have improved them—it may be after some degeneracy from the original stock—by a judicious cross. He has at present a large number of most beautiful, symmetrical little Berkshires—alike, some two or three dozen of them, in shape and size, as so many peas from the same pod; and would make a most attractive pen, and carry off premiums at a cattle-show, with those who go for fat, pretty things; but he condemns them as being too small, weak on the loin, and bad breeders. They have fallen into general disfavor in the South. But of all hogs that have come within our knowledge, from abroad, none have been altogether equal, in all points, to the famous "*Parkinson hog*," which was landed in Alexandria in 1800, and which, it is said, were sent a present to General Washington, but were, it is said, by Parkinson taken to himself by a *misappropriation!* They were remarkably *square-built* hogs, with broad backs, round bodies, rather small legs of middling length; built up in the body on the model of the Bakewell sheep; black and white spotted, with a slight predominance of white, and of middling size; neither too short-legged nor too fat to travel in search of the natural food, without which no good bacon can be had. If any one yet has this breed in anything like its original excellence, we should like to know who; but of this we have little hope, since that most observant and sagacious grazier we have ever known, the late *William Steenbergen*, of the valley of Virginia, told us twenty-six years ago, and twenty years after the importation, that he considered them the most perfect animals he had ever seen; and that their first cross on our native hogs was equally perfect; *but that, after breeding in and in*, they degenerated into a character vastly inferior to *either of the original kinds*. If any man's agricultural sayings deserved to take the force of axioms, his did.*

* Since writing the above, we have seen a hog very nearly resembling the old Parkinson, in the sty of Mr. Lewis Morris, near Fordham, in Westchester Co. His *pigs* were farrowed in March, and he expects them to net 175 pounds at Christmas. They *are* fed on corn, and *hard* corn at that—the Yellow Dutton. [*Ed. Farm. Lib.*

It is in this same way that, with very, very few exceptions, all improved imported animals—Berkshire hogs among the rest—have degenerated. Those—the few—who have the spirit to buy, commonly get but a pair, and go on breeding without recourse occasionally to other families and prime individuals of the same breed; and hence the inevitable consequence, deterioration. If here we refer again to the example of Mr. Patterson, of Springfield, as effectually avoiding this error in breeding his Devon and other stock, it is because it is our *bounden duty* to hold up the example of men who have the sagacity to comprehend what is necessary, and the spirit to carry it out. Liberal as was the supply of North Devons originally sent to this country by *Mr. Cooke* to *Mr. Patterson's father*, if he had gone on breeding, as Mr. Caton did, from the same stock, without having recourse, as Mr. P. does, every two or three years, to the best to be had in England, the Devon stock would by this day have been degenerated and condemned. Instead of which, we very lately saw 26 Devon cows and heifers in one lot, with an imported bull, the like of which for beauty, considering the number—for form, color and size, are not elsewhere to be seen in the United States, if in England. In respect of the breed of hogs best adapted to good bacon, let us quote the opinion of a much esteemed and judicious friend, Evan Thomas, of Baltimore: "I may also add that much of the reputation of Maryland and Virginia hams is owing to the breed of hogs, a mixture of the European and African races. The small bone, thin skin and high flavor are derived from the latter. A cross with the Chinese has produced a disposition to take on more flesh." But we must try back if we would "*save our bacon.*"

To have the best hams, then, it is indispensable to have hogs *corn-fed*, and *not too large;* we should say from 120 to not exceeding 160. The disposition of the fat when not frozen will afford a pretty good criterion for those who have to buy their hogs, which is usually done some time in December. The fat should be hard, and crack about the kidneys into small squares, like beef suet. Eschew such whose fat is more tenacious, inclined to transparency, adhering to the fingers, and bearing the complexion of lard. The lard of corn-fed pork, when tried, on getting cold, becomes hard and white. We incline to the opinion, however, that if hogs have been left to run at large, and can be taken up in good condition, as they are sometimes, even fat, from the mast, a much shorter period of corn-feeding than is generally supposed will answer.

And here we may lay it down as a general principle, applicable in this case, that when an animal is fattening to be killed, his life should be taken when he gets at his best, without leaving him to fall off, either from want of appetite or food, under the impression that he may be re-fatted. When the hog has got in fine order on mast, and that is over, give him corn, or corn meal and clean water, for two weeks, and then give him the knife. And this was the opinion more than two centuries ago, when people knew much more of the practice of husbandry than we are apt to suppose, only they did n't understand the reasons why, as well as we are beginning to understand them; and the better we do, the more certain will be the results. Thus it was old Tusser's advice,

> "Let hog, once fat,
> Lose nothing of that;
> When mast is gone,
> Hog falleth anon."

The general practice, however, is to corn-feed them for four, five, and even six weeks; and this *may* be best, but it certainly makes dear meat of it.

The flavor and texture of all kinds of meat is much more quickly changed than

we are apt to imagine. A highly respected correspondent once made to us the following statement: "In the year 1770 I resided in New-Jersey, where it was the custom to take great numbers of wild pigeons in spring-nets, by the assistance of decoy pigeons. The flesh of these birds, when first taken, is always very dark, and most generally tough. I have seen more than 300 of them confined and fed in a large corn-house, and in one week their flesh has not only become tender, but as white as a well-fed chicken." It is well known that cattle fed upon oil-cake cannot be immediately killed with advantage; but, if kept from it for two or three days, the oily taste is effectually removed. The late Gen. Forman, of Rose Hill, Maryland, once told us that the taste of garlic would pass out of the flesh and very marrow of a bullock, if kept from it 24 hours before being killed. We are, on the whole, disposed to think that two weeks' feeding on corn would be sufficient not only to divest the meat of any unacceptable flavor, but to harden it—saying nothing of the saving to be thereby accomplished.

We will suppose, then, that you have your *corn-fed* hogs, that have attained the proper consistence of flesh by wholesome exercise, and the peculiar flavor to be derived from roaming in the woods and wallowing in the mud;* and what next?

Cutting up.—On this point it is deemed proper to warn against the practice of some in permitting the shoulder to be cut *large*, with some of the ribs attached; because the shoulder requires three weeks to smoke, while the middlings need only two. The shoulder should therefore be cut as short as possible. On the other hand, and on various points, we may here give the caution suggested by friend Thomas, who says: "It is proper here to mention that *hams* are generally cut too short, causing a great loss of juice, both in curing and boiling. The knife should be passed very near the kidneys, through what is called the 'small of the back.' There the vessels converge, and soon close up in drying."

Next, as to salting. There is too much disposition to apply an over-dose, in the fear of losing the meat, but the saltness of meat depends more on time than quantity. For every 1,000 pounds of meat, three pecks of salt, with one-third or one-half pound of saltpetre, is sufficient. It will be better to mix equal quantities of Liverpool and ground alum salt, for in very soft weather the Liverpool will run off almost too quickly, while in dry, cold weather the alum is too slow to do its office within the proper time. This composition should be well rubbed on on both sides, and then sprinkled thickly on the cut surface of the meat. There is no danger of oversalting from quantity; it is length of time that has that effect; but a larger quantity would be wasted: and let every farmer and housewife remember that "every little makes a mickle." The meat should now be laid in good casks—the hams first, skin downward, and then the shoulders, chines, jowls, spare-ribs, &c.

In two weeks the casks are to be emptied, and all but hams and shoulders removed, being salted sufficiently; while those larger pieces, the hams and shoulders, are to be re-packed, putting those which seem the least salted lowest among the brine. A change of position is necessary, for the pressure is so great that the brine will not press equally through the meat, if it is not once thus turned and shifted. Some deem a tight vessel for catching the brine unnecessary, if not injurious. In that case there is not the less necessity to shift the meat and re-sprinkle salt, if so placed as that the superincumbent weight is considerable.—The late Jacob Gibson, of Talbot County, famous for his good bacon as for some

* Hence, in Maryland called a "mud-lark"—ham or shoulder, *the wing of a mud-lark.*

other remarkable things, bored holes in the bottom of his meat-casks to let the brine run off. Three weeks is sufficient for the shoulders, and four for the hams to remain in salt. Every piece of meat, on being taken from the salt, should be cleanly washed by dipping a cloth in clean hot water, and washing off the salt brine and dirt.

On the use of *sugar*, there is much difference of opinion and practice; as in France about dressing salad, every company is divided into factions. There is the faction of the three and the faction of the five parts of oil to one of vinegar; and, according to the strength of these factions at dinner, the dressing is prepared by a member of the one or the other: and these factions, it must be admitted, have the public weal about as much at heart as *some others* that serve to keep States in agitation. Our own persuasion is, after much inquiry and some experience, that sugar is altogether superfluous; and we have known very observant managers not only omit the use of it, as we believe the majority do, but some contend that it may even be prejudicial. We will here give the solicited suggestions of our friend, Evan Thomas, whose letter has been already quoted:

"The hams being neatly trimmed, insert a string through the *upper* or broad end; then rub the outside and edges well with fine salt. Two heaped tea-spoonsfull of a mixture of finely powdered saltpetre and pure red pepper should be spread over each ham, on the inner or fleshy side, and pressed well in with a broad table or butcher's knife. Let them lie 3 or 4 hours, to imbibe the mixture; then spread on each ham six ounces of coarse brown sugar, and finally cover them with salt. Pack them closely in boxes or tubs that will permit the drippings to pass off freely. Take care to cover every bare spot with salt. Let them lie 20 or 21 days; if very large, a little more sugar and saltpetre mixture may be added, and they may remain 4 or 5 days longer in salt.

General Remarks.—The hogs when killed should be hung up to cool, but on no account be permitted to freeze. When frozen, let them be perfectly thawed before the salt is applied. When hung up in the smoke-house, let *no open fire be kindled in moist or rainy weather*. I use a small sheet-iron stove, in which a little fire may be put every day—sufficient to keep a dry atmosphere, and prevent mould on the meat. In dry, clear weather, a small hickory fire may be made once in 5 or 6 days. In fine, moderate weather, let a free current of air pass through the house. When sufficiently cured, before the insects appear, put them in paper bags and hang them up.

N. B.—I would recommend the salt to be rolled or pounded fine."

To the above we will now append the observations with which we were favored for the American Farmer, more than twenty-eight years ago, before any other agricultural paper came into existence, by the late Dr. Wilkins, of Baltimore—a man as remarkable for closeness of observation as for the soundness both of his judgment and *his bacon*—on the use of sugar and saltpetre:

. . . "It will be perceived that I have not mentioned the article sugar, so much esteemed by many. Ten years' experience with it, and ten years' experience without it, have fully corrected my judgment on this article. If any person will try two parcels, one with and the other without sugar, he will find the following result: That his bacon cured with sugar will be deprived of the fine red color two months longer for that addition; therefore it is certain that it interferes with the saltpetre, and, if the saltpetre is of any service, the sugar prevents that, and I presume it adds nothing to compensate.

"The fresh, mawkish taste of the saltpetre is admirably adapted to temper the excessive sapid flavor of common salt, while the beautiful red color is highly pleasing to the eye. It likewise interferes with the salt, and prevents too large a quantity from being absorbed, and thus preserves the meat from that hardness which bacon acquires when this article is left out. Hickory ashes I am told answer nearly all the good purposes of saltpetre." . . .

"A small chimney in brick houses, on a corner of the wall, may be useful to let out the smoke, but *no* holes in the wall to admit a ray of light. Some chips and a few billets of hickory make the best smoke—these will also keep the house *warm*, which is very important; for if the smoke-house is *cold*, as will be the case when the smoke is carried by a

fine from a lower story or another house, all our former care will be lost—a damp will settle on the bacon, and it will have a bitter flavor.

"Mr. A——, of Baltimore, taught me never to make a smoke in damp weather—a practice so much followed; for, as he observed, his meat gained no color, but got a bad taste. I am satisfied he was correct; and he had large experience, as he followed smoking for gain. One good fire per diem will smoke the pieces exactly in the same times they were salted, viz. hams 4 weeks, shoulders 3 weeks, other pieces 2 weeks. When the bacon is smoked and all returned to the smoke-house, a floor, if not laid before, should now be laid on the joist; by this means rats will be prevented from descending on the bacon, and the heat of the sun will be moderated, so that the bacon will not drip in summer heats. Darkness and coolness are necessary to preserve the bacon from flies; it may there hang in perfect safety till wanted. But a prudent housekeeper will inspect his meat in May and June, and then he will see the quality of his meat; that which is not corn-fed will crack and offer places of deposit for skippers, which should be filled up with ashes; and, if any are already deposited, let the ashes be taken out of the hearth as hot as fire, and put in.—The meat that is corn-fed will be close all around the cut. A ham of the first kind will shrink in boiling, and cut but a poor figure on the table, while the latter will swell to roundness, and overlook the dish—will look as proud, if not as warlike, as Juvenal's lobster. When the sharp carver enters the cover, the essence will flow in a stream and fill the whole dish—a most delightful sauce! Such a dish, with boiled poultry and savoys, though often repeated, never loses its relish with the laborious husbandman, and he seldom thinks of any other to set before his guest."

Thus, then, reader, we have told you what is necessary, as far as depends on yourself, to have hams such as we will venture to say the Queen of England never saw, of her own curing. The next thing to be attended to is, how to preserve them from *flies and skippers;* and, finally, *how to cook them.* But we are pressed for room, and it is time enough for that before your meat is smoked. It shall not be forgotten. In the mean time, however, a few more last words in

VINDICATION OF THE RIGHTS OF THE HOUSEWIFE!—On this head we may repeat that, while we shall ever claim from the ladies the performance of duties properly within their province, we shall as studiously resist the imposition of burdens which are alike incompatible with their position in the domestic circle, and the delicacy of their constitution. We mean then to say that the superintendence of the cutting up, and salting, and smoking the meat for the year's family consumption, *does not properly belong to the lady of the house;* although we know that, time immemorial, this task has been, in many neighborhoods, imposed on them. It is a heavy, coarse, laborious operation, which ought to be done under the *eye of the master.* It is his duty to prepare *everything* for the hands of the *cook*, and it is not until everything for the table is placed away under lock and key, that the wife should be called on for *her attention.*

There is good sense in the homely lines of old Father Tusser. Let both husband and wife take the hint:

> "Good usage, with knowledge and quiet withal,
> Makes huswife to shine as sun on the wall;
> What husband provideth with money, his drudge
> The huswife must look to, which way it doth trudge."

AGRICULTURAL ZEAL.—At a late meeting in Ireland for the discussion of an agricultural question, there were present from four to five thousand persons. Call a meeting in this country to take measures for compelling law-makers to provide for appropriate *instruction* for their sons in Agriculture, or for the imposition of a duty on free articles that might be produced at home, and you would not be able to get as many together as would make the Presidents, Vice-Presidents and Secretaries of a "party" meeting! But summon them to attend to form a military company, or to take measures for the success of *the* party, and you would find them flocking in from all quarters, like hogs coming in all directions when, on a frosty morning, the swineherd winds his horn, or cries c-h-o-k-e! c-h-o-k-e! c-h-o-k-e!

HONOR INVENTORS!

IMPLEMENTS AND IMPLEMENT MAKERS.

PENNOCK'S REVOLVING RAKE.

Agricultural Societies in our country, and perhaps in all countries, bestow too large a proportion of their attention and premiums on sleek *animals* and big crops, and too little on *implements*, and on experiments, and for the ascertainment of new facts in respect of crops, manures, &c.

What we need most is cheaper labor, and more thorough tillage and preparation of the land. The place of cheaper labor must be supplied by every possible contrivance in the structure of implements for saving labor; hence it would be far better to give $100 for a new and improved implement, such as Pennock's Revolving Rake, than to give $20 for the best animal, if not very extraordinary. Great inducements should be offered, too, for the application of steam to agricultural purposes. Let any one reflect for a moment how much manual labor it supplies in factories, on railroads, in navigation, &c. and he cannot but desire to see it doing more for Agriculture.

There is no class of benefactors more liable to the effects of piracy and ingratitude than *inventors*—and especially inventors of improvements in implements and machinery applied to agricultural uses. The abuse in these cases takes place all over the country, so that it becomes impossible to arrest it.

We have been struck with the truth and force of this fact in many cases, and in none more than in that of the *Revolving Rake*, invented by friend Pennock, of Delaware. If, in the business of manufacturing or of navigation, a man had invented an improvement of equal labor-saving efficacy, it would have made him independent forever; and if the agricultural community were to make him up $25,000, they would do him no more than justice. This admirable implement is used not only all over our country, we believe, without leave or license from the inventor, but over Europe also. We saw it everywhere in our travels the past summer. If Agricultural Societies cannot otherwise reward such men, the least they can do is to make honorable mention of them in their annals. But reward is chiefly bestowed and premiums offered for large and fat animals *because* they are animated forms, that fill the eye and that serve to collect a crowd and swell out a show.

Ought premiums to be given, in any case, where the native animal is not at least equal to the imported ancestor, if of full blood? If they be, are they not virtually premiums for *advancing backward?* Would not any agricultural implement that would enable a farmer to do with it double as much of any given sort of work in a day as he can do now, be better worth a premium than all that have been given for largest crops of Indian corn the last seven years? In a single county in England, where astonishing progress has been made, and where formerly they assigned only $150 of prizes to the implement department, they now appropriate $1,000.

Our implement-makers are to the agricultural community what the Quartermaster's Department is to the Army. Let their ingenuity be stimulated and rewarded by every means at the command of all associations got up for the pro-

motion of agricultural improvement—for our *Republican Government*, be it remembered, has no reward in reserve for *that* sort of merit or discovery. Let their largest premiums bear the names of distinguished inventors. Let us have the Whitney Premium—the Pennock Premium—the Hussey Premium—the Ruggles and Nourse Premium—the Prouty and Mears Premium—the Buel—the Ruffin—the Garnett—the Walsh—the Moore, and the Lowell, &c. Premiums.—Print their names in large letters on premium books and premium plate. Do anything but take up old premium lists 30 years old, and alter the dates, and vamp them up and proclaim them anew!

THE PITCH-PINE TREE:

DANGER OF ITS EXTINCTION—THE CAUSE AND THE REMEDY.—INJURIOUS EFFECTS OF THE UNIVERSAL PURSUIT OF POPULARITY.

In the first volume of this work we published a lucid exposition of the business of gathering tar and turpentine—its process and profits—for which we felt, as did the public, much indebted to Col. McLeod, of Smithville, North Carolina.

We were struck with his remark that there are no new crops of pitch-pine coming on in regular succession to those which have been destroyed; and that this source of our national strength and wealth appears to be in a fair way of being extinguished.

We are inclined to believe in the truth of the suggestion of a much respected correspondent that the reason is to be found in the destruction of the young pine by *hogs*. To them the root is as acceptable as any of the esculent vegetables. The pine grows the first year or two, as does the carrot, with a large, succulent, and, to the hog, very palatable *tap-root*, and, of course, according to the modern theory of vegetation in regard to trees, without any *lateral* roots, at that stage of its existence. Hence the animal is able at once to devour the root and extirpate the tree. Thus is it that a few miserable runts are not only protected but encouraged to destroy the prospect of one of the greatest and most important of our naval stores and of public income—one as necessary in a public as it is valuable in a private view; and this merely because, in North Carolina and other States congenial to the growth of this most valuable tree, the *fence laws* of our mother country have been exactly reversed. In England the owners of stock are required to *fence them up*, so that the fruits of special agricultural labor may receive no detriment; but our wise men, sacrificing everything to a truckling policy, have required the farmer to fence his cultivated fields against the vagrant stock of his neighbor, who being either poorer or more lazy, or both, than the farmer, must have the privilege, forsooth, of allowing his hogs to *range the whole county in quest of food*—thus at once subjecting the farmer to a heavy poor tax, and injuring the whole stock of the country. But this is not the only instance in which the great interests and the morals of society are endangered and sacrificed to a mean and pernicious hunting after popularity. It converts aristocrats at heart into miserable demagogues, and fills the land with sycophants and hypocrites, with venders of alcoholic poison and licensed receivers of stolen goods.

This single perversion of public policy, which requires every man to guard his

crops against depredation, instead of requiring every man to keep up his stock or make him answerable for double the amount of the injury it may do to his neighbors, costs this country many, many hundred millions of dollars—more than all the buildings and other improvements together. Let any man having 500 acres of land, calculate the first outlay and the interest on the cost of his timber or stone fences, and the view of the result will prompt him to ask the question, Is there no remedy for an evil so enormous? Agricultural Societies would do much better were they to unite their influence and devote themselves to inquiries after remedies for such grievances, than in giving premiums for match horses and fat hogs. But to them nothing is so startling as a proposition to inquire into remedies for political and moral evils that work injuriously to the interests they represent. In the New-York State Agricultural Society it was even made a question whether it was within their province to entertain any discussion or to express any opinion as to the policy of legislative encouragement to *direct, express agricultural education!*

Farmers willingly submit to be taxed, and pay large sums annually for educating the privileged few in the science of war, in Army and Navy schools, but they seem to cower and tremble when it is proposed that they should have the presumption to demand an equal or proportionate amount for instruction in the great, all-sustaining art of Agriculture! Not even agricultural journals, with a very few exceptions, are seen to stand up for and insist upon it.

You will see grave Senators adjourn their legislative sittings, as at Annapolis, to go and see midshipmen fire cannon, at the expense of their constituents, and yet dare not open the inquiry, How much does this cost, and might we not in like manner have the mechanical principles of plows and threshing-machines exemplified and explained at the expense of the Government, at a Normal school, with far more benefit to the real interests of Society?—When will farmers wake up to a sense of what is due to common sense and to their own rights?

Botany as a Branch of Agricultural Education.—How long before the following will apply to any American College?

Examination Paper used in University College, London, for the Senior Class of Botany: Midsummer, 1847.—1. What is protoplasm? and what its chemical differences from the cell-wall? 2. Describe briefly the structure, station and supposed origin of starch, and the use of it in the vegetable economy. 3. What are hairs? 4. Can hairs be used advantageously in distinguishing plants from each other? Give examples. 5. Describe the nature of the fibro-vascular tissue of a leaf, its origin, its position, and its use. 6. What is the use of leaves to plants? 7. How does it happen that some plants, although incapable of forming leaves, nevertheless perform their functions perfectly in their absence? 8. What is albumen? How does it originate? What physiological purpose does it serve? 9. What is vitellus? and in what natural orders does it occur? 10. What are the most usual properties of leguminous plants? 11. How would you distinguish Marants from Gingerworts? 12. State briefly the botanical difference between Myrtle-blooms, Citronworts, Tutsans, and Rueworts, all of which have dotted leaves: and mention the usual properties of each. 13. Suppose that allspice (*Eugenia acris* and *Pimento*) were mixed with pepper (*Piper nigrum,*) and the two were roughly pounded together, by what mark would you expect to detect the mixture? 14. Let pepper and Larkspur-seed be pounded together, could you then detect the mixture? and how?

John Lindley, Ph. D., F. R. S., Professor.

Interesting Chemical Fact.—Water saturated with one-third of its weight of common salt will still dissolve sugar; and if completely charged with carbonic acid, it will dissolve iron.

LETTER XI.

THE MOST PROFITABLE BREED OF SHEEP FOR THE SOUTH.—PRINCIPLES OF BREEDING.

Breeds should be adapted to the circumstances of a Country...Circumstances requiring a Mutton Sheep ...Comparison between Mutton Sheep—The South-Downs, Leicesters and Cotswolds...How far the Feed Markets, &c., of the South demand such breeds...What breed of Sheep will give the greatest value of Wool from the feed of an acre?...Comparative Consumption and Wool Product of the Mutton breeds and the Merino—Other Expenses—Comparative Hardiness, &c...A pound of fine wool can be grown as cheaply as a pound of coarse—worth more for market or for consumption...The Mutton of the Merino and its Crosses...What sub-variety of the Merino best adapted to the wants of the South?...Review of the History of Wool-Growing and the Wool Markets since 1824...Tariffs and Prices...Injudicious course of the Manufacturers—Have discouraged the growth of fine wool and encouraged that of medium and coarse... A surplus of medium wools, and a bare or short supply of fine...Manufacturers now in the power of fine wool growers...Interest of the Manufacturers to encourage the growth of fine wools by paying better prices—are beginning to do so—will be compelled to continue this course...Will the North furnish the increasing demand?—No—Reasons...Fine wool in every point of view more profitable than coarse for cultivation in the South...Comparison between Merinos and Saxons...Crosses between them...Points which constitute excellence in a Merino—proper size—per centage of wool to live-weight—shape and general appearance—skin—wrinkles...The wool—what parts it should cover—its gum—length and weight of fleece—evenness—style—softness—serration—manner of opening, &c...Principles of breeding...In and-in breeding...Crossing...English Crosses with the Merino...Views of Mr. Livingston concerning the use of cross-bred rams—of the French breeders—of the author...Great importance of starting a flock with choice rams—with different strains of blood.

Dear Sir: No one breed of sheep combines the highest perfection in all those points which give value to this race of animals. One is remarkable for the weight, or early maturity, or excellent quality of its carcass, while it is deficient in quality or quantity of wool; and another which is valuable for wool, is comparatively deficient in carcass. Some varieties will flourish only under certain conditions of feed and climate, while others are much less affected by those conditions, and will subsist under the greatest variations of temperature, and on the most opposite qualities of verdure.

In selecting a breed for any given locality, we are to take into consideration *first*, the feed and climate, or the surrounding natural circumstances; and, *second*, the market facilities and demand. We should then make choice of that breed which, with the advantages possessed, and under all the circumstances, will yield the greatest net value of marketable product.

Rich lowland herbage, in a climate which allows it to remain green during a large portion of the year, is favorable to the production of large carcasses. If convenient to markets where mutton finds a prompt sale and good prices, then all the conditions are realized which call for a *mutton*, as contradistinguished from a *wool-producing* sheep. Under such circumstances, the choice should undoubtedly, in my judgment, rest between the improved English varieties—the South-Down, the New Leicester, and the improved Cotswold or New Oxfordshire sheep. In deciding between these, minor and more specific circumstances are to be taken into account. If we wish to keep large numbers, the Down will herd* much better than the two larger breeds; if our feed, though generally plentiful, is liable to be shortish during the drouths of summer, and we have not a *certain* supply of the most nutritious winter feed, the Down will better endure occasional short keep: if the market calls for a choice and high-flavored mutton, the Down possesses a decided superiority. If, on the other hand, we

* That is, remain thriving and healthy when kept together in large numbers.

wish to keep but few in the same inclosure. the large breeds will be as healthy as the Downs; if the pastures be wettish or marshy, the former will better subsist on the rank herbage which usually grows in such situations; if they do not afford so fine a quality of mutton, they, particularly the Leicester, possess an earlier maturity, and both give more meat for the amount of food consumed, and yield more tallow.

The next point of comparison between the Long and Middle wooled families, is the value of their wool. Though not the first or principal object aimed at in the culture of any of these breeds, it is, in this country, an important item or incident in determining their relative profitableness. The American Leicester* yields about 6 lbs. of long, coarse, combing wool; the Cotswold something more, but this perhaps counterbalanced by other considerations; the Down from 3 lbs. to 4 lbs. of a low quality of carding wool. None of these wools are very salable, at remunerating prices, in the American market. Both will become more so, as manufactures of worsted, and of flannels and baizes, increase. The difference in the weight of fleeces between the breeds is, *per se*, a less important consideration than would first appear, and for reasons which will be given when I speak of the connection between the amount of wool produced and the food consumed, by sheep.

Of the Cheviots I have taken no notice in this connection, as they are obviously inferior to the preceding breeds, except in a capacity to endure rigorous weather, and to subsist on heathy herbage. No part of the South has a climate too severe for the more valuable races, and its grasses and other esculents, wherever found, and as far as they go, are, making the proper allowances for wet and dry lands, highly palatable and nutritious to all the varieties which respectively feed in such situations.

Under the natural and artificial circumstances already alluded to, which surround Sheep Husbandry in many parts of England—where the fattest and grossest quality of mutton is consumed as almost the only animal food of the laboring classes—the heavy, early maturing New Leicester, and the still heavier New Oxfordshire sheep, seem exactly adapted to the wants of producer and consumer, and are of unrivaled value. To depasture poorer soils—sustain a folding system—and furnish the mutton which supplies the tables of the wealthy—the South-Down is an equal desideratum.

Have we any region in our Southern States, where analogous circumstances demand the introduction of similar breeds? The climate, so far as its effect on the *health* is concerned, is adapted to any, even the least hardy varieties; but not so its effects on the verdure on which they are to subsist. The long, scorching summers, so utterly unlike those of England, leave the grass on lands stocked heavily enough for profit, entirely too dry and short for the heavy, sluggish Long Wools. This is particularly true in the tide-water zone. Mutton, too, sheeted over externally with three or four inches of solid fat,† even if it could be made acceptable to the slave, in lieu of his ration of bacon—a thing more than doubtful—would never find any considerable market off from the plantation. So far as the supply of feed is concerned, the above remarks apply, though not equally, to the South-Down. It will live and thrive where the Long Wools would dwindle away, but it is a mistake to suppose that the heavy im-

* I use the word "American" Leicester, because it is notorious that this, as well as the Cotswold—and *all the other* heavy English varieties, soon lose in the weight of their fleeces when subjected to the climate and the (best ordinary) system of feeding in the United States. I should except, perhaps, a few highly pampered animals.

† Five and even six inches of solid fat, on the rib, is not uncommon in England. In the Cotswolds the fat and lean are more intermixed, and the mutton is of a better quality; but it would be considered entirely too luscious and tallowy by Americans.

proved South-Down will subsist, and attain its proper weight and fatness, on very poor or very scant herbage. The old *unimproved* variety would, like some other smallish and hardy races, obtain a living on keep as poor as that which grew on the lightest and thinnest soils of Sussex. Moulded by the hand of Ellman, and other breeders, to better fulfill the conditions of a mutton sheep, in size and other particulars, they demand that increased supply of food which the formation of additional fat and muscle require. Retaining some of the properties of the parent stock, they are less sluggish, and bear travel better than the Long Wools; but with them as with the latter, and *all other animals*, much or prolonged exercise in pursuit of food or otherwise, is unfavorable to obesity. Men, and particularly *owners*, in advocating the claims of this breed and that, seem not unfrequently to forget that the general physical laws which control in the development of all the animal tissues as well as functions, are uniform. Better organs will doubtless make a better appropriation of animal food; and they may be taught, so to speak, to appropriate it in particular directions—in one breed, more especially to the production of fat—in another, of muscle or lean meat—in another, wool. But, *cæteris paribus*, large animals will always require more food than small ones. Animals which are to be carried to a high state of fatness must have plentiful and nutritious food, and they must exercise but little in order to prevent the unnecessary "combustion" in the lungs, of that carbon which forms more than seven-tenths of their fat. No art of breeding can countervail these established laws of Nature.

Again, there are no facilities in the South for marketing large quantities of mutton—of a tithe of that which would be annually fitted for the shambles, were Sheep Husbandry introduced to anything like the extent I have recommended, and with the *mutton breeds* of sheep. With few cities and large villages—with a sparse population—with an agricultural population the greatest drawback on whose pecuniary prosperity is their inability to market their own surplus edibles—not a particle of rational doubt can exist on this point. True, I have expressed the opinion that, both as a matter of healthfulness and economy, mutton should be substituted for a moiety of the bacon used on the plantation; but with such a change, in a country so exclusively agricultural, each landholder would raise his own supply, and thus no market be created. It may then be regarded as a settled point that the production of wool is the primary, the great object of Southern Sheep Husbandry.

In instituting a comparison between breeds of sheep for wool-growing purposes, I will, in the outset, lay down the obviously incontrovertible proposition that the question is not what variety will shear the heaviest or even the most valuable fleeces, irrespective of the cost of production.—Cost of feed and care, and every other expense, must be deducted, to fairly test the profits of an animal. If a large sheep consume twice as much food as a small one, and give but once and a half as much wool, it is obviously more profitable, other things being equal, to keep *two* of the smaller sheep. The true question then is, *with the same expense in other particulars, From what breed will the verdure of an acre of land produce the greatest value of wool?*

Let us first proceed to ascertain the comparative amount of food consumed by the several breeds. There are no satisfactory experiments which show that *breed*, in itself considered, has any particular influence on the quantity of food consumed. It is found, with all varieties, that the consumption is in proportion to the live weight of the (grown) animal. Of course, this rule is not invariable in its individual application, but its gen-

eral soundness has been satisfactorily established. Spooner states that grown sheep take up $3\frac{1}{3}$ per cent. of their weight in what is equivalent to dry hay per day, to keep in store condition. Veit places the consumption at $2\frac{1}{2}$ per cent. My experience would incline me to place it about midway between the two. But whatever the precise amount of the consumption, if it is proportioned to the weight, it follows that if an acre is capable of sustaining three Merinos weighing 100 lbs. each, it will sustain but two Leicesters weighing 150 lbs. each, and two and two-fifths South-Downs weighing 125 lbs. each. Merinos of *this weight* often shear 5 lbs. per fleece, taking flocks through. The herbage of an acre, then, would give 15 lbs. of Merino wool, and but 12 lbs. of Leicester, and but $9\frac{3}{5}$ lbs. of South-Down (estimating the latter as high as 4 lbs. to the fleece)! Even the finest and lightest fleeced sheep ordinarily known as Merinos, average about 4 lbs. to the fleece, so that the feed of an acre would produce as much of the highest quality of wool sold under the name of Merino, as it would of New Leicester, and more than it would of South-Down! The former would be worth from fifty to one hundred per cent. more per pound than either of the latter! Nor does this indicate all the actual difference, as I have, in the preceding estimate, placed the live-weight of the English breeds low, and that of the Merino high. The live-weight of the four-pound fine-fleeced Merino does not exceed 90 lbs. It ranges from 80 to 90 lbs., so that 300 lbs. of live-weight would give a still greater product of wool to the acre.* I consider it perfectly safe to say that *the herbage of an acre will uniformly give nearly double the value of Merino, that it will of any of the English Long or Middle wools.*

The important question now remains, What are the *other* relative expenses of these breeds? I speak from experience when I say that the Leicester† is in no respect a hardier sheep than the Merino—indeed, it is my firm conviction that it is *less hardy*, under the most favorable circumstances. It is more subject to colds, and I think its constitution breaks up more readily under disease. The lambs are more liable to perish from exposure to cold, when newly dropped. Under *unfavorable* circumstances—herded in large flocks, pinched for feed, or subjected to long journeys—its capacity to endure, and its ability to rally from the effects of such drawbacks, do not compare with those of the Merino. The high-bred South-Down, though considerably less hardy than the unimproved parent stock, is still fairly entitled to the appellation of a hardy animal. In this respect I consider it just about on a par with the Merino. I do not think, however, it will bear as hard stocking as the latter, without a rapid diminution in size and quality. If the peculiar merits of the animal are to be taken into account in determining the expenses—and I think they should be—the superior fecundity of the South-Down is a point in its favor, as well for a wool-producing as a mutton sheep. The South-Down ewe not only frequently yeans twin lambs, as do both the Merino and Leicester, but she possesses, unlike the latter, nursing properties to do justice by them. But this advantage is fully counterbalanced by the superior longevity of the Merino. All the English mutton breeds begin to rapidly deteriorate in amount of wool, capacity to fatten, and in general vigor, at about 5 years old; and their early maturity is no offset to this, in a sheep kept for wool-growing purposes. This early decay would require earlier and more rapid slaughter or sale than would always be economically convenient, or even possible, in a region situated in all respects like the South. It is well, on

* It is understood that all of these live-weights refer to *ewes* in fair ordinary, or what is called store condition.

† I speak of full-blood Leicesters. Some of its crosses are much hardier than the pure bred sheep.

properly stocked farms, to slaughter or turn off the Merino wether at four or five years old, to make room for the breeding stock; but he will not particularly deteriorate, and he will richly pay the way with his fleece, for several years longer. Breeding ewes are rarely turned off before *eight*, and are frequently kept until *ten* years old, at which period they exhibit no greater marks of age than do the Down and Leicester at *five* or *six*.—I have known instances of Merino ewes breeding uniformly until 15 years old! The Improved Cotswold is said to be hardier than the Leicester; but I have said less of this variety, throughout this entire Letter, as from their great size* and the consequent amount of food consumed by them, and the other necessary incidents connected with the breeding of so large animals, the idea of their being introduced as a *wool-growing sheep* anywhere, and particularly on lands grassed like those of the South, is, in my judgment, utterly preposterous. There is one advantage which all the coarse races of sheep have over the Merino. Either because their hoofs do not grow long and turn under from the sides, as do those of the Merino, and thus hold dirt and filth in constant contact with the foot, the coarse races are less subject to the visitations of the hoof-ail, and, when contracted, it spreads with less violence and malignity among them. Taking all the circumstances connected with the peculiar management of each race, and all the incidents, exigencies, and risks of the husbandry of each fairly into account, I am fully convinced that the expenses, other than those of feed, are not smaller *per capita*, or even in the number required to stock an acre, in either of the English breeds above referred to, than in the Merino. Nor should I be disposed to concede even equality, in these respects, to either of those English breeds, excepting the South-Down.

You write me, Sir, that many of the South Carolina planters are under the impression that coarse wools will be most profitably grown by them, *first*, because there is a greater deficit in the supply, and they are better protected from foreign competition; and, *secondly*, because they furnish the raw material for so great a portion of the woolens consumed in the South. Each of these premises is true, but are the conclusions legitimate? Notwithstanding the greater deficit and better protection, do the coarse wools bear as high a price as the fine ones? If not, they are not as profitable, for I have already shown that *it costs no more to raise a pound of coarse than a pound of fine wool*. Nay, a pound of *medium* Merino wool can be raised *more cheaply* than a pound of the South-Down, Leicester, or Cotswold! This I consider clearly established.

Grant that the South requires a much greater proportion of coarse than of fine wool, for her own consumption. If a man needing iron for his own consumption, wrought a mine to obtain it, in which he should happen to find gold equally accessible and plentiful, would it be economical in him to neglect the more precious metal because *he* wanted *to use* the iron? or should he dig the gold, obtain the iron by exchange, and pocket the difference in value? Would it be economical to grow surplus wool, wool for market, worth from 25 to 30 cents per pound, when it costs no more per pound to grow that worth from 40 to 45 cents? And even for the home want, for the uses of the plantation—for slave-cloths, &c.—*fine wool is worth more per pound than coarse for actual wear or use!* Is this proposition new and incredible to you? I challenge the fullest investigation of its truth, through the testimony of those familiar with the subject, or through the direct ordeal of experiment. It is true that a piece of fine broadcloth is not so strong, nor will it wear like a Chelmsford plain of treble thick-

* I saw two at the late N. Y. State Fair, at Saratoga, which weighed over 300 lbs. each!

ness. The threads of the former are spun to extreme fineness to economize the costly raw material. To give it that finish which is demanded by fashion—to give it its beautiful nap—these threads are still farther reduced by "gigging" and "shearing." But spin fine wool into yarn as coarse as that used in Chelmsfords, and manufacture it in the same way, and it would make a far stronger and more durable cloth. The reasons are obvious. Merino wool is decidedly stronger than the English coarse Long and Middle wools—or any other coarse wools—in proportion to its diameter or bulk. It felts far better, and there is therefore a greater cohesion between the different fibres of the same thread, and between the different threads. It is also more pliable and elastic, and consequently less subject to "breaking" and abrasion.

Unless the views I have advanced are singularly erroneous, it will be seen that, for wool-growing purposes, the Merino possesses a marked and decided superiority over the best breeds and families of coarse-wooled sheep. As a mutton sheep, it is inferior to some of those breeds, but not so much so as it is generally reputed to be. If required to consume the *fat and lean together*, many who have never tasted Merino mutton, and who have an unfavorable impression of it, would, I suspect, find it more palatable than the luscious and over-fat New Leicester. The mutton of the cross between the Merino and "Native" sheep would certainly be preferred to the Leicester, by anybody but an English laborer used to the latter. It is short-grained, tender, and of good flavor. The same is true of the crosses with the English varieties. These will be, hereafter, more particularly alluded to. Grade Merino wethers (say half-bloods) are favorites with the Northern drover and butcher. They are of good size—extraordinarily heavy for their apparent bulk*—make good mutton—tallow well—and their pelts, from the greater weight of wool on them, command an extra price. They would, in my opinion, furnish a mutton every way suitable for plantation consumption, and one which would be well accepted in the Southern markets.

In speaking of the Merino in this connection, I have in all cases, unless it is distinctly specified to the contrary, had no reference to the Saxons—though they are, as it is well known, pure-blooded descendants of the former.

Assuming it now as a settled point, that it is to the Merino race that the wool-grower must look for the most profitable sheep, let us now proceed to inquire which of the widely varying sub-varieties of this race are best adapted to the wants and circumstances of the South. A brief glance at the history of wool-growing, and of the wool markets, for the last few years, will form an useful preliminary inquiry, and will assist us materially in arriving at a correct conclusion.

On the introduction of the Saxons, about twenty-four years since, they were sought with avidity by the holders of the fine-wooled flocks of the country, consisting at that time of pure or grade Merinos. The Tariff of 1824 imposed a duty of 20 per cent. on wools costing above 10 cents per pound, gradually rising to 30 per cent., and 15 per cent. on those costing less than 10 cents. Foreign woolen cloths† were subject to an *ad valorem* duty of 30 per cent. until June 30th, 1825, and after that it was raised to 33⅓ per cent. The Tariff of 1828 immediately raised the duty on all wools to 40 per cent. *ad valorem* and 4 cents per pound specific duty, and 5 per cent. was to be annually added to the *ad valorem* duty, until it should reach 50

* On account of the shortness of their wool, compared with the coarse breeds.

† Where I use the word "cloths" here and in the statements of the different Tariffs which follow, you will understand that I do not include carpetings, blankets, worsted stuff goods, &c.

per cent. (in 1831.) The duty on woolen cloths was also raised (after June, 1829) to 45 per cent., and that exceeding $4 the square yard to 50 per cent. Under the decisive encouragement offered to both the wool-grower and manufacturer by this Act, a great impetus was given to the production of the finest wools, and the Saxons everywhere rapidly superseded, or bred out by crossing, the Spanish Merinos. The latter disappeared almost entirely from New-York and New-England. In the fine-wool mania which ensued, weight of fleece, constitution, and everything else, were sacrificed to the quality of the wool. The Tariff of 1832 imposed a 40 per cent. *ad valorem* and 4 cents per pound specific duty on wools costing over 8 cents; and it raised the duty on all broadcloths to 50 per cent. It made wools costing less than 8 cents per pound free of duty. The "Compromise" Tariff of 1833 commenced a system of progressive reductions until the maximum rate of duties should not exceed 20 per cent. The following Table will give the duties of each year, on wool and cloths, under this Act, estimating the *ad valorem* and specific duties on wools exceeding 8 cents, together in an average per centage :*

TABLE 14.

	Per ct. ad val.	1833.	1835.	1837.	1839.	1841.	1842.
Wool costing less than 8 cents per pound at place of exportation	free.	free.	free.	free.	free.	free.	20
Wool costing over 8 cents per pound	54	50·60	47·20	43·80	40·40	30·20	20
Woolen cloths	50	47	44	41	38	29	20

The Tariff of 1841 struck out the 20 per cent. duty on the 8 cent wools. The Tariff of 1842 again imposed an *ad valorem* duty of 5 per cent. on wools costing *seven* cents or under, and raised it on the higher wools to 30 per cent. *ad valorem* and 3 cents per pound specific duty, and on cloths to 40 per cent. *ad valorem*. The Tariff of 1846 established an *ad valorem* duty of 30 per cent. on all wools, and on cloths. By referring to Table 7, Letter V., it will be seen that the prices of wool have not been controlled by the amount of the protection. They reached their maximum in 1836, and then fell off, not again to rally, (except during the single year 1839)—not again to reach 40 cents—until 1844. Why was this? What produced the sudden depreciation of 1837? The Tariffs of 1828 and 1832 gave *too much protection* to both wool-grower and manufacturer. Their pursuits became the *El Dorado* of agricultural and mercantile speculators. Skill without capital, and capital without skill, and in some cases probably thirst of gain without either, rushed into these favored avocations. The bank inflations of the period fanned the fires of speculation, and taught some of the wisest commercial heads of the country to forget the providence that had hitherto distinguished them. The natural result followed. In the financial crisis of 1837, manufacturing, and all other monetary enterprises which had not been conducted with skill and providence, and which were not based on adequate and real capital, were involved in a common destruction, and even the solidest and best conducted institutions of the country were shaken by the fury of the explosion. Wool suddenly fell almost 50 per cent. (from 54 to 30 cents per pound.)† In 1838 it rallied a little, and in 1839 it again reached 50 cents, but it went down nearly to the minimum point in 1840. The grower began to be discouraged. He who bred the delicate Saxons, (and, as I have already said, they now comprised the flocks of nearly all the large wool-growers in the country,)

* The reduction of one-tenth of the excess over 20 per cent. took place Dec. 31st, each year, to 1841; then one-half of the residue of the excess; and on the 30th of June, 1842, the other half of said residue was deducted.

† The quality of the wools here alluded to will be found specified in a note on the second page of Letter V.

was not obtaining the actual first cost per pound of his wool. He clamored loudly for an increase of duties on the foreign article, as the reductions of the "Compromise" Act were now approaching their ultimate standard—20 per cent.—and he attributed the low prices to this cause: Saxon wool continued low, and did not pay its first cost in 1841 and 1842. Was this due solely to the reduction of the Tariff? A reference to Table 11 (Letter IX.) will show that the import of foreign woolens was less from 1836 up to and including 1842, than for the six preceding years! Where then was the foreign competition which was driving the manufacturer to keep down the price of wools? The Tariff of 1842 raised the duty on wool 10 per cent. and added a specific duty of 3 cents per pound; and it raised the duty on cloths from 20 to 40 per cent. The import of foreign woolens sunk, the succeeding year, to a lower point than it had touched since 1821, and in 1844 and 1845 it did not reach the *average* of the six years preceding the enactment of the Tariff of 1842. A reference to Table 9 (Letter IX.) will show that the import of foreign *fine* wools also largely fell off. This coincided with the expectations of the advocates of a higher Tariff, but another and equally legitimate expectation entertained by the great body of Northern wool-growers—that *they* were to *share* in the benefits arising from the exclusion of foreign competition—was signally disappointed. The Tariff of 1842 was enacted on the 30th day of August, and part of the clip of that year was sold under its operation. Wool sold that year *lower* than it had for the five preceding years, viz., for 30 cents. The next year it advanced one penny! General discouragement now seized upon the growers of fine wool. The market was not overstocked—foreign competition was light, but *still they could not* sell their wool for its first cost! To add to their mortification, the manufacturer, by a most short-sighted policy, would scarcely make a discrimination of 6d. per pound between Saxon wool and medium Merino and grade wools weighing nearly twice as much to the fleece. If the grower of medium wool got 25 cents per pound for fleeces weighing 4 lbs.—thus realizing $1 per fleece—the ordinary Saxon grower would get but 30 cents per pound for fleeces weighing 2½ lbs., and thus realize but 75 cents!* When the Saxon growers found that the Tariff of '42 brought them no relief, they began to give up their costly and carefully nursed flocks. The example, once set, became contagious, and there was a period when it seemed as if all the Saxon sheep of the country would be sacrificed to this reäction. Many abandoned wool-growing altogether, at a heavy sacrifice of their fixtures for rearing sheep. Others crossed with coarse-wooled breeds, and rushing from one extreme to the other, some even crossed with the English mutton breeds! Some more judiciously went back to the parent Merino stock, but usually they selected the heaviest and coarsest wooled Merinos, and thus materially deteriorated the character of their wool. As the preceding period had been distinguished by its mania for *fine* wool, this was, by its mania for *heavy fleeces!*† The English crosses, however, were speedily abandoned.‡ The Merino regained his

* And though the larger, stronger sheep, bearing the medium wool, would eat more, it was far hardier, required less protection and care of every kind, and would increase more rapidly—circumstances which would far more than counterbalance its excess of consumption.

† I make no claim of having possessed greater sagacity or foresight in these particulars than the mass of breeders. I began with the Merino. These I crossed with the Saxon, and I also bred the pure-blood Saxons for several years. Unsatisfied with these, I made some experiments with the English mutton breeds, both as pure bloods and crosses. Finding none of them equal to the Merino as a wool-producing sheep, I returned to the latter, and I bred for *heavy fleeces* until the manufacturers saw fit to make a juster discrimination in the prices paid by them for the different qualities of wool.

‡ I mean by those who sought to improve their *fine-wooled* flocks by an English cross. English and all other coarse-wooled sheep are immensely and rapidly improved, for wool-growing purposes, by a proper fine-wooled cross, as I have already and shall again have occasion to mention.

supremacy, lost for nearly twenty years, and again became the popular favorite. It was generally adopted by those who were commencing flocks in the new Western States, and gives its type to the sheep of those regions.

It will be seen from the preceding facts that the supply of fine wool* has proportionably decreased, and that of medium and coarse increased. This has driven the manufacturers to make a juster discrimination in prices. They now realize that their own short-sighted economy has been all but fatal to fine wool-growing in the United States. And they cannot but feel that in destroying this interest, *they destroy themselves.* Our manufacturers are not so miserably blind as to dream of drawing their raw material from foreign countries—of paying an import duty of 30 per cent. and then competing with the English manufacturer who pays an import duty not exceeding two pence per pound! It is doubtful, in my mind, whether the home supply will not fall considerably short of the home demand for fine wool *for this year!*† The point has been already reached where but a little more discouragement, or a little *longer continued* discouragement, would have banished these wools from the country! So far, the manufactories have not felt this evil, for they have not been compelled to import. Neither pampered nor persecuted by the Tariff of 1846—called for by the consumption of the country—with solid capital and greater experience and skill at their command—they are rapidly increasing, and rising on a solider basis than ever before. So, to *sustain our manufacturing interest,* (that engaged in the manufacture of fine cloths,) it is absolutely necessary that the diminution of *fine* wools be not only immediately arrested, but that the growth of them be immediately and largely increased. These facts now first beginning to be clearly appreciated by the manufacturer—will deter him from resorting to his former suicidal policy. Instances have recently come to my knowledge of manufacturers offering to contract with fine-wool growers for their entire clips, for a term of years, at an advance on present prices—prices, be it remembered, higher than they have been except for two years (1839 and 1844) since the overthrow of 1837. Should the manufacturer, however, again forget his own interest, the fine-wool grower has it in his power to teach it to him most effectually. Instead of being discouraged and driven from the business, he has but to withhold his wools for a season—say for a few months, to compel the former to import wools at a ruinous cost—stop his machinery, or pay fair prices at home! I believe in no combinations to control prices. Something far better than vague report, however, says that several of the large manufacturing establishments of New-England employed the *same agents,* last season, to buy much, if not all of their wools—and that these wools were subsequently divided by bidding or otherwise, among the parties to the transaction! *Is this denied?* I think it will not be denied. If this was so, what was it but a combination to control prices?‡ But whether

* To make myself clearly understood, I will, in the remarks which follow, classify wools as follows: *superfine,* the choicest quality of wool grown in the United States, and never grown here excepting in comparatively small quantities; *fine,* good ordinary Saxon; *good medium,* the highest quality of wool usually known in the market as Merino; *medium,* ordinary Merino; *ordinary,* grade Merino and perhaps selected South-Down fleeces; *coarse,* the English long wools, &c. This subdivision is not minute enough, by any means, to express fully the number of well-defined classes which exist in wool. A farther multiplication of them here, however, I have thought would only tend to confusion.

† The position has been all along taken that the general supply was under the demand, but the deficit hitherto has been principally in medium and coarse wools. See Table 9, Letter IX.

‡ And before leaving this point, I will ask another question: Why were most of the wools of New-York and New-England untouched and unlooked at by the agents of the manufacturers this year, contrary to all preceding customs for two or three months subsequently to shearing? These same agents flocked in droves to the Western States and bought up their entire clip immediately after shearing, while reports were constantly coming back that this manufactory and that had purchased its entire supply for a year, or perhaps two years? Was this because the Eastern growers demanded exorbitant prices? Was it because anything like an approach to a supply of fine wools could be found in the West? Or was it the result of a

so or not, when we compare the profits which have inured to the growers and manufacturers of fine wool for the last few years, it behooves the former both to *speak* and *act* decidedly. Their interests have been sacrificed *long enough!* But it is to be hoped that the grower of these wools will not be hereafter driven to the alternative of either suffering himself, or of defending himself by retaliatory measures. Some few of the manufacturers have always, I believe, taken a high and liberal course. Enough others, as already remarked, now see the necessity of such liberality to prevent any combined or general effort to depress prices.

Will the North again turn its attention to the growth of superfine and fine wools—again supply the demand, and keep up with it as it increases? Not unless stimulated by the inducement of extraordinary profits—not, certainly, against the competition of the South. The climate north of 41°, or, beyond all dispute, north of 42°, is too severe for any variety of sheep *commonly known*, which bear either of these classes of wools. In fact, the only such variety, in anything like general use, is the Saxon; and this is a delicate sheep, entirely incapable of safely withstanding our Northern winters, without good shelter, good and regularly administered food, and careful and skillful management in all other particulars. When the season is a little more than usually backward, so that grass does not start prior to the lambing season, it is difficult to raise the lambs of the mature ewes—the young ewes will in many instances disown their lambs, or, if they own them, not have a drop of milk for them; and if in such a crisis, as it *often happens*, a north-east or north-west storm comes driving down, bearing snow or sleet on its wings, or there is a sudden depression of the temperature from any cause, no care will save multitudes of lambs from perishing.* And it will not do to defer the time of having them dropped to escape these evils, or they will not attain size and strength enough to pass safely through their first winter.† A few large sheepholders, whose farms, buildings, etc., have been arranged with exclusive reference to the rearing of these sheep, may continue to grow fine wool *until driven from it by the competition of the South;* but many of these have recently adopted a Merino cross. The ordinary farmers, the small sheepholders, who, in the aggregate, grow by far the largest portion of our Northern wools, have imbibed a deep-seated aversion—nay, a positive disgust—against the Saxon sheep. They have not the necessary fixtures for their winter protection, and they are entirely unwilling to bestow the necessary amount of care on them. Besides, mutton and wool being about an equal consideration with this class of farmers, they want larger and earlier maturing breeds. But, above all, they want a strong, hardy sheep, which demands no more care than their cattle. The strong, compact, medium-wooled Merino—or, perhaps still more generally, its crosses with coarse varieties, producing the wool which I have classified as ordinary—will be the general favorites.—The same reasons will weigh still more strongly in the North-west, where, as I have shown, the climate is a still worse one for delicate sheep. All these causes will tend to swell the amount of medium, ordinary and coarse

concerted movement to bring the Eastern grower into taking last year's prices? It actually did so, in a multitude of instances—or, he was contented to receive the slightest advance on them! This will be found true of nearly all who sold soon after the market opened in the East. If not the result of a concerted and combined movement, the *general* desertion of the Eastern and resort to the Western market by the manufacturers was a most singular coincidence! These manufacturers are now *fain* to purchase Eastern wools at a *considerable* advance from the prices of 1846—and, as already hinted, it is highly problematical, in my mind, whether they will not be compelled to *import* at a still higher advance, to eke out a deficiency! It is to be hoped that this will be the last *Act* in the *drama* of folly and suicide played by our manufacturers.

* Not even in close barns, and with constant attendance.

† North of latitude 42°, it is necessary, as a general rule, that lambs be dropped in the first half of May, to give them this requisite size and strength. Occasional cold storms come nearly every season up to that period, and not unfrequently up to the first of June. Mr. Grove was a decided advocate of early lambs.—He used to say that "it was better to lose two of them in the spring than one in the fall."

wools. Though the reäction has been but recent, the market demand for medium and ordinary wools is now better supplied—nearer being glutted, so far as I am enabled to judge—than that for fine and superfine. And should the market become glutted with either or both, it is important to remember that the *latter* will be far more profitable for *export* than the former.

Every consideration, then, in my judgment, points to wools ranging from good medium upward, instead of the lower classes, as the most profitable staples for cultivation in the South. The only question which now arises on this point is, from which variety, the Saxon or Merino, shall the South attempt to cultivate these wools?

It is generally supposed, and as a general thing it is true, that the Merino bears no better wool than that which I have classified as good medium. But the measurements of Dr. Emmons (given in Letter X.) show, by the infallible testimony of the microscope, that heavy-fleeced Merinos sometimes equal—nay, surpass Saxons, in fineness. The fact is more decisive, as the Saxon fibres there measured came not only from the most celebrated flocks—from the prize sheep at State Fairs—but it also came from samples, in most instances, given by the *owners* for *public exhibition*. I do not claim that Merinos like these are common. They are rather to be regarded in the light of those prodigies of excellence which occasionally appear, but which it is difficult to reproduce with anything like uniformity. Nor are lesser fleeced Merinos, bearing wool equal to ordinary Saxon, very common. During the *fine wool mania*, all, who sought fine wool, bred the Saxon sheep, or crossed with it; and the few who stood out, and clung to the Merino, generally aimed to distinguish it as widely as possible from the former, by increasing the weight of its fleece, to the disregard of its fineness. This, too, was the general disposition during the *heavy-fleeced mania*. Of consequence, but very few of our breeders have ever, or until recently, sought a high degree of fineness in fleece in breeding the Merino. Recent experience has satisfied me that this is rapidly attainable. Mr. Lawrence, in a quotation already made by me (in Letter I.), says: "I believe a breed may be reared which will give four pounds of exquisitely fine wool to the fleece." I know by multiplied experiments that once interbreeding between an ewe bearing good medium wool (the fleece weighing, say, from 4½ lbs. to 5 lbs.), with a Merino ram of sufficiently high quality, will produce wool in the offspring equaling ordinary Saxon, and a fleece averaging 4 lbs., with none of its weight made up of *gum*. The result of *two* such interbreedings will bring the progeny of a heavy-fleeced medium ewe (provided her fleece is properly *even*) to the same point. The four-pound fine-fleeced Merino would be a far more profitable animal than the Saxon, other things being equal. But other things are not equal. The former is every way a hardier animal, and a better nurse. It is about 20 lbs. heavier, and therefore consumes more feed; but I consider this additional expense more than counterbalanced by the additional care and risk attending the husbandry of the Saxon. If required to keep the number good, and give the proper attention to the rearing of lambs, I would sooner engage to keep, at the same price, one thousand such Merinos for a year, than to keep the same number of Saxons.

It would be practicable, doubtless, to increase the Saxon's fleece to 4 lbs.; but any one, familiar with such experiments, knows that it is far easier to increase fineness of wool, by diminishing weight of fleece and carcass a little, than it is to increase weight of fleece and carcass without lowering the quality of the wool. And there is this additional objection to the latter

system of breeding, so far as the Saxon is concerned. The breeder is not only called upon to increase the weight of its fleece and carcass, but to engraft on it hardiness of constitution, nursing properties, etc., which by no means follow, as a matter of course, its improvement in the former particulars. These, and particularly the latter, could only be attained, so as to be transmissible with a proper degree of certainty from parents to offspring, by years of breeding, accompanied by a rigorous course of selection. If, therefore, you were called upon to *form* a variety just suited to your wants, the Merino would present the most ductile and the safest materials. But the Southern agriculturist, just entering upon sheep-rearing, would not be prepared to conduct nice experiments in breeding. He wants a breed or variety already prepared to his hand. And for the same reasons, notwithstanding the fineness of his climate, he wants a hardy breed—one that demands no extra skill, no great experience, for its management. Merinos reaching or closely approaching the standard above specified are now to be found, while there is no corresponding variety of Saxons; and to incur the risks arising from inexperience, want of preparation, &c., the superior hardiness of the former would, of course, render them entirely preferable.

Some have recommended a cross between the Saxons and Merinos, as a cheap and ready method of obtaining a four-pound fine-fleeced sheep. A properly selected Saxon ram, crossed with good medium and medium-wooled Merino ewes, cutting from 5 lbs. to 5½ lbs. of wool, will almost uniformly produce this result. And it is easier *now* to get the Saxon than the Merino, fine enough for this purpose. Or a flock may be bred up from Saxon ewes and a Merino ram. The objection to both courses is the same, though not equal to that which exists against breeding the full-blood Saxons—viz., the production of a feeble and a poor nursing sheep. The latter evil, especially, clings for generations to these cross-bred animals, so far as my experience and observation have extended. And unless Saxons are selected which do not possess the characteristic faults of the variety, the cross-breds are inferior to pure-blood Merinos in many *other and essential* particulars, notwithstanding the fleece may be all that we desire.

There is another important point where the pure-blood Merino possesses a marked advantage. Few Southern wool-growers will *commence* their flocks exclusively with high-bred animals of any kind. With a few of them to breed rams from, and to *gradually* grow up a full-blood flock, they will *mainly* depend upon grading up the common sheep of the country. With the long-legged, bare-bellied, open-wooled sheep common in the South (as it once was in the North), the Saxon makes an indifferent cross. Their faults run too much *in the same direction*, in all save the fineness of wool, for, however good its shape, the wool of the Saxon is comparatively short and open. It therefore shortens the wool of the common sheep, without adding much or any to its thickness, and thus the fleece remains a light one. Precisely all this is the reverse of what results from a cross between the Merino and the common sheep. The wool is but little shortened, unless the staple of the common sheep was very long; it is essentially thickened; it is made to extend over the belly; the fleece is, therefore, greatly increased in weight; the sheep is rendered more compact and "stocky," and it is brought nearer to the ground. Even the first cross, though its fleece is somewhat *uneven*, is a prime sheep for the wants of ordinary farmers, and among these it is, accordingly, a decided favorite, over the whole Northern States. A majority of them would, I think, give it preference over any other kind or variety of sheep. Two or three more proper Merino crosses raise it to the rank of a *first-rate wool-growing sheep*—scarcely

inferior to the full-blood Merino in anything, save that *it does not transmit its good qualities with quite so much certainty to its offspring.**

Let us now proceed to inquire what are the points which constitute excellence, or mark a departure from it, in the class of Merino sheep which I have attempted to show form, in every point of view, the most suitable variety to commence wool-growing with in the South. What should be its size, weight of fleece, shape, general appearance, style of wool, &c. &c.?

Size, within extremes, is not, *per se*, a matter of much consequence.—There should, however, be *uniformity* in this particular, at least through the same flock, not only for their good appearance, but larger sheep are apt, by their superior strength, to crowd away small ones from the rack or trough. A sheep very small of *its breed and family*, is commonly less hardy. If very large, *it must travel farther to fill itself;* and, therefore, this would be an objection to it in a breed designed to graze on short and scant pasturage—for the extra exercise thus made necessary would cause it to waste (in the form of carbon, in the lungs) a considerable portion of the food, which would, under other circumstances, be converted into animal tissues. Very large, like very small animals, of the same species—and, I am inclined to think, the former more frequently—lack the robustness, vigor of muscle, capacity to endure unusual and protracted exercise, or privation of food, or any other unfavorable deviation from ordinary habits, possessed by compact medium-sized animals. This rule will be found to apply among all domestic animals. Lastly, I am not prepared to prove, but I *believe* that, with the *same breeding*, the woolly, like the osseous and muscular tissues of a large Merino sheep, will not be as fine as those of a smaller one. I do not found this opinion, so far as wool is concerned, upon, nor do I claim that it is supported by, any analogies. I state it as solely the result of individual observation. If it is a tendency which can be successfully resisted, I never have been fortunate enough to have a sufficient number of instances brought under my eye, in any one flock, to have them constitute anything more than sparse exceptions to what I deem a well established rule. I have never known a family of very large Merinos bearing anything better than medium wool; and the first step to any decided improvement in them immediately reduces their weight, for it can only be effected by interbreeding with finer and smaller families. Ewes weighing from 80 lbs. to 90 lbs. alive, in good fair store condition, are of about the proper size, in my judgment, where *fine wool* is the object.† Rams should weigh 40 lbs. or 50 lbs. more. Ewes of the large Merino families weigh from 100 lbs. to 110 lbs.—the rams 50 lbs. more; nor do even these equal the size of some of the late imported French Merinos.

A relation analogous to the preceding one, exists between the weight of the fleece and its quality. This point has already been sufficiently set forth on another page. The opinion is there expressed that the Merino may be easily bred, by judicious selection of sire and dam, to bear 4 lbs. of fine wool, or wool equaling ordinary Saxon. I would now add that, as a *general rule*, and in large flocks, I do not believe *more* than this can be obtained, without a depreciation in the quality, among ewes. The ram's fleece should in all cases, in a very superior animal, be about double that of the ewe. Five per cent. of the live-weight of the carcass, with ewes, is the maximum weight of *fine* wool, which we can, in the present state of breeding, look for with any uniform certainty. This would give a fleece of 4 lbs. to 80 lbs. of live-weight. As the fine-wool Merinos increase, and thus give a wider range and better selection of materials for nice experi-

* The latter point will be more particularly adverted to in a subsequent part of this Letter.

† Saxons weigh about 20 lbs. less.

ments, it is very possible that the per centage of the fleece may be increased. Mr. Lawrence, in speaking of attaining a four-pound fleece of "exquisite" quality, undoubtedly alluded to the wool which I have classed as superfine. The four-pound fleeced *fine* Merino can undoubtedly be made *superfine*, by diminishing the weight of its fleece 10 or 12 ounces or a pound; and even then it will be a hardier and better animal than the finer class of Saxons which now produce this wool. But whether Mr. Lawrence's standard can be fully attained, neither experience nor observation enable me to decide. If it could, and the sheep be equal to the four-pound *fine*-fleeced Merino in other respects, we should have a *perfect sheep*. Such wool has sold this year at upward of 60 cents per pound, which would bring the fleeces to $2 40 a piece! It may be well here to glance at the comparative worth of fleeces in the several Merino families, taking this year's prices, and taking the weights which are usually found accompanying the several qualities, in prime ordinary flocks. A *fine* fleece of 4 lbs., at 50 cents,* would be worth $2; good medium, weighing 4½ lbs., at 40 cents, $1 80; medium, weighing 5 lbs., at 32 cents, $1 60. And the consumption of feed rises with the diminution of quality. Admitting the daily consumption of hay for 150 days to be 3 per cent. to the live-weight, 100 fine Merinos, averaging 85 lbs. each, would consume about 19 tons of hay; and 100 medium Merinos, averaging 105 lbs. each, would consume about 23½ tons—an important difference in their relative expenses! The fine-wooled Merino does not, like the Saxon, lose his advantage in this particular by his inferior hardiness.

The shape and general appearance of the Merino should be as follows: The head should be well carried up, and in the ewe hornless. It would be better on many accounts to have the ram also hornless, but, being usually characteristic of the Merino, many prefer to see them. The face should be shortish, broad between the eyes, the nose pointed, and in the ewe fine and free from wrinkles. The eye should be bright, moderately prominent, and gentle in its expression. The neck should be straight (not curving downward), short, round, stout—particularly so at its junction with the shoulder, forward of the upper point of which it should not sink below the level of the back. The points of the shoulder should not rise to any perceptible extent above the level of the back. The back, to the hips, should be straight; the crops (that portion of the body immediately back of the shoulder-blades) full; the ribs well arched; the body large and capacious; the flank well let down; the hind-quarters full and round—the flesh meeting well down between the thighs, (or in the "twist.") The bosom should be broad and full; the legs short, well apart, and perpendicular, (*i. e.*, not drawn under the body toward each other when the sheep is standing.) Viewed as a whole, the Merino should present the appearance of a low, stout, plump, and—though differing essentially from the English mutton-sheep model—a highly symmetrical sheep.

The skin is an important point. It should be loose, singularly mellow, of a rich, delicate pink color. A colorless skin, or one of a tawny, approaching to a butternut hue, indicates bad breeding. On the subject of wrinkles, there is a difference of opinion. Being rather characteristic of the Merino—like the black color in a Berkshire hog, or the absence of all color in Durham cattle—these wrinkles have been more regarded, by novices, than those points which give actual value to the animal; and shrewd breeders have not been slow to act upon this hint! Many have contended that more wool can be obtained from a wrinkled skin; and this is the view

* This is not high for *fine* Merino wool. Though I sold my lot for 42 cents, I was offered 50 cents for the fleeces of nearly all my later-bred sheep, if I would sell them separately.

of the case which has induced both the Spanish and French breeders to cultivate them—the latter to a monstrosity. I confess that I agree, to a considerable extent, with Mr. Joshua Kirby Trimmer,* that "this idea is as wild as that which some of our theorists have entertained, that, by laying lands in high ridges and low furrows, the surface of the earth and its produce is increased." Though I once entertained a different opinion, the steel-yards have satisfied me that an exceedingly wrinkled neck does not add but a little to the weight of the fleece—not enough to compensate for the deformity, and the great impediment which it places in the way of the shearer. I have owned rams, the labor of shearing six of which, in a nice and workmanlike manner—cutting the wool off short and smooth, on and among the multitude of folds and wrinkles—was fully equivalent to shearing fifteen ordinary Merino rams, or twenty-five ewes—that is to say, a day's work for one man. And none but a skillful shearer could, with *any* time given him, clip the wool short and smooth among the wrinkles, without frequently and severely cutting the skin. A smoothly drawn skin, and absence of all dewlap, on the other hand, would not, perhaps, be desirable.

The wool of the Merino should densely cover the whole body, where it can possibly grow, from a point between and a little below the eyes, and well up on the cheeks, to the knees and hocks. Short wool may show, particularly in young animals, on the legs, even below the knees and hocks—but long wool covering the legs, and on the nose below the eyes, is unsightly—without value—and on the faces it frequently impedes the sight of the animal, causing it to be in a state of perpetual alarm, and disqualifying it to escape real danger. Neither is this useless wool, as seems to be thought by some, the slightest indication of a heavy fleece. I have as often seen it on Saxons scarcely shearing 2 lbs. of wool, and on the very lightest fleeced Merinos.

The amount of *gum* which the wool should exhibit, is another of the mooted points. Here, as in many other particulars, experience has changed my earlier impressions. Merino wool should be yolky or "oily," prior to washing—though not to that extreme extent, giving it the appearance of being saturated with grease, occasionally witnessed. The extreme tips of the wool may exhibit a sufficient trace of gum to give the fleece a darkish cast—particularly in the ram—but a black, pitchy gum, resembling semi-hardened tar, extending an eighth or a quarter of an inch into the fleece, and which *cannot be removed in ordinary washing*, is, in my opinion, decidedly objectionable. There is a white or yellowish *concrete* gum, not removable by common washing, which appears in the *interior* of some fleeces, which is equally objectionable.

The weight of fleece remaining the same, medium length of staple, with compactness, is preferable to long, open wool, inasmuch as it constitutes a better safeguard from inclemencies of weather, and better protects the sheep from the bad effects of cold and drenching rains in spring and fall. The wool should be as nearly as possible of even length and thickness over the whole body. Shortness on the flank, and shortness or thinness on the belly, are serious defects.

"Evenness of fleece" is a point of the first importance. Many sheep exhibit good wool on the shoulder and side, while it is far coarser and even hairy on the thighs, dewlap, &c. Rams of this stamp should not be bred from by any one aiming to establish a superior fine-wooled flock, and all such ewes should be gradually excluded from those selected for breeding.

The "style of the wool" is a point of as much consequence as mere

* "Practical Observations on the Improvement of British Fine Wools, &c." by the above, 1828.

fineness. Some very fine wool is stiff and the fibres almost straight, like hair. It has a dry, *cottony* look. This is a poor, unsalable article, however fine the fibre. Softness of wool—a delicate, silky, highly elastic feel, between the fingers or on the lips, is the first thing to look after. This is usually an index, or inseparable attendant, of the other good qualities, so that an experienced judge can decide, with little difficulty, between the quality of two fleeces, in the *dark!* Wool should be finely serrated or crimped from one extremity to the other—*i. e.*, it should present a regular series of minute curves, and, generally, the greater the number of these curves in a given length, the higher the quality of wool in all other particulars. The wool should open on the back of the sheep in *connected masses*, instead of breaking up into little round spiral ringlets of the size of a pipe-stem, which indicate thinness of fleece; and when the wool is pressed open each way with the hands, it should be dense enough to conceal all but a delicate rose-colored line of skin. The interior of the wool should be a pure, glittering white, with a lustre and "liveliness" of look not surpassed in the best silk.

The points in the *form* of the Merino which the breeder is called upon particularly to eschew, are—a long, thin head, narrow between the eyes—a thin, long neck, arching downward before the shoulders—bad crops—back falling behind the shoulders—narrow loin—flat ribs—steep, narrow hind quarters—long legs—thighs scarcely meeting at all—legs drawn far under the body at the least approach of cold. All these points were separately or conjointly illustrated in many of the Saxon flocks which have been recently swept from the country. The points to be avoided in the fleece have been sufficiently adverted to.

Having thus attempted to establish a standard for the Merino-breeder, it remains that we examine some of the most important principles, in breeding, by which that standard is to be reached or maintained.

The first great starting-point, among pure-blood animals, is that "like will beget like." If the sire and dam are perfect in any given point, the offspring will generally be; if either is defective, the offspring will (subject to a law presently to be adverted to) be half way between the two; if both are defective in the same point, the progeny will be more so than either of its parents—it will inherit the amount of the defect in both parents *added together*. There are exceedingly few perfect animals. Breeding, then, is a system of counterbalancing—breeding out—in the offspring, the defects of one parent, by the marked excellence of the other parent, *in the same points*. The highest blood confers on the parent possessing it the greatest power of stamping its own characteristics on its progeny; but blood being the same, the male sheep possesses this power in a greater degree than the female. We may, therefore, in the beginning, breed from ewes possessing any defects short of cardinal ones, without impropriety, provided we possess the proper ram for that purpose; but the flockmaster, aiming at a high standard of quality, should *gradually* throw out from breeding all ewes possessing even considerable defects. Every year should make him more rigorous in his selection. But from the beginning—and in the beginning more than at any other time—the greatest care should be evinced in the selection of the ram. If he has a defect, that defect is to be inherited by the whole future flock. If it is a material one, as, for example, a hollow back, bad crops, a thin fleece, or a highly uneven fleece, the flock will be one of low quality and little value. If, on the other hand, he is perfect, the defects in the females will be lessened, and gradually bred out. But it being difficult to find *perfect* rams, we are to take those which have the fewest and lightest defects, and none of

these material ones, like those just enumerated. And these defects are to be met and counterbalanced by the decided excellence (sometimes running to a fault) *of the ewe*, in the *same points*. If the ram is a little too long-legged, the shortest-legged ewes should be selected for him; if gummy, the dryest-wooled ewes; if his fleece is a trifle below the proper standard of fineness, (but he has been retained, as it often happens, for weight of fleece and general excellence,) he is to be put to the finest and lightest fleeced ewes, and so on. Having a selection of rams, this system of counterbalancing would require little skill, if each parent possessed but *one* fault. If the ewe was a trifle too thin fleeced, and good in all other particulars, it would require no nice judgment to decide that she needed to be bred to an uncommonly thick-fleeced ram. But most animals possess, to a greater or less degree, several defects. To select so that every one of these in the dam shall meet its opposite in the male, and *vice versa*, requires not only plentiful materials to select from, but the keenest discrimination. The time and the convenient method of selecting the ewes for the several rams, and the subsequent management, will be hereafter pointed out.

We will now suppose that the breeder has established his flock—that he has done so successfully, and given them an excellent character. He is soon met with a serious evil. He must "breed in-and-in," as it is called—that is, interbreed between animals more or less nearly related in blood—or he must seek rams from other flocks, to the risk of losing or changing the distinctive character of his flock, hitherto sought so sedulously, and built up with so much care. It is contended by the opponents of in-and-in breeding that it renders diseases and all other defects hereditary, and that it tends to decrease of size, to debility, and a general breaking up of the constitution. Its apologists, on the other hand, insist that, if the parents are perfectly healthy, incestuous connexion does not, *per se*, tend to any diminution of healthiness in the offspring; and they also claim, what must be conceded, that it enables the skillful breeder much more rapidly to bring his flock to a particular standard or model—and much more easily to keep it there—unless it be true that, in course of time, they will dwindle and grow feeble. So far as the effect on the constitution is concerned, both positions *may* be, to a certain extent, true. But it is, perhaps, difficult to always decide with certainty when an animal is not only free from disease, but from all tendency or predisposition toward it. A brother and sister may be apparently healthy—may be actually so—but may possess an idiosyncrasy which, under certain circumstances, will manifest itself.—If these circumstances do not chance to occur, they may live, apparently possessing a robust constitution, until old age. If bred together, their offspring, by a rule already laid down, will possess the idiosyncrasy in a double degree. Suppose the ram be interbred with sisters, half-sisters, daughters, grand-daughters, &c., for several generations, the predisposition toward a particular disease—in the first place slight, now strong, and constantly growing stronger—will pervade, and become radically incorporated into, the constitution of the whole flock. The first time the requisite exciting causes are brought to bear, the disease breaks out, and, under such circumstances, with peculiar severity and malignancy. If it be of a fatal character, the flock is rapidly swept away; if not, it becomes chronic, or periodical at frequently recurring intervals. The same remarks apply, in part, to those defects of the outward form which do not at first, from their slightness, attract the notice of the ordinary breeder. They are rapidly increased until, almost before thought of by the owner, they destroy the value of the sheep. That such are the common effects of in-and-in breed-

ing, with such skill as it is ordinarily conducted, all know who have given attention to the subject; and for these reasons the system is looked upon with decided disapprobation and repugnance, as among all kinds of domestic animals, by nine out of ten of the best practical farmers of the Northern States.

How, then, shall the sheep-breeder avoid the effects of in-and-in breeding, and at the same time preserve the character of his flock? He should do so by seeking rams of the *same breed*, and possessing, *as nearly as possible, the characteristics which he wishes to preserve in his own flock.* If the latter rule is neglected—if he draws indiscriminately from all the different families or varieties of a breed—some large and some small—some long and some short-wooled—some medium and some superfine in quality—some tall and some squabby—some crusted over with black gum, some entirely free from it, &c. &c.—breeding will become a mere hotch-potch, and no certain or uniform results can be looked for. So many varieties cannot be fused into one, for a number of generations;* and it not unfrequently happens, as between the different classes of Saxons alluded to by Mr. Spooner,† that certain families can never be successfully amalgamated.

But suppose the breeder has reached no satisfactory standard—that his sheep are deficient in the requisites he desires? If the *desired requisites are characteristic of the breed* he possesses, he is to *adhere to the breed*, and select better animals to improve his own inferior ones. If he has an inferior flock of South-Downs, and wishes to obtain the qualities of the best South Dams, he should seek for the best rams of that breed. But if he wishes to obtain qualities *not characteristic of the breed he possesses*, he must *cross with a breed which does possess them.* If the possessor of South-Downs wishes to convert them into a fine-wooled sheep similar to the Merino, he should cross his flock steadily with Merino rams—constantly increasing the amount of Merino and diminishing the amount of South-Down blood. To effect the same result, he would take the same course with the common sheep of the country, or any other coarse race. There are those who, forgetful that some of the finest varieties now in existence, of several kinds of domestic animals, are the result of *crosses*, bitterly inveigh against the practice of crossing, under any and all circumstances. As frequently conducted, where objects incompatible with each other are sought to be attained—as, for example, an attempt to unite the fleece of a Merino and the carcass of a Leicester, by crosses between those breeds—it is an unqualified absurdity. But under the limitations already laid down, and with the objects specified as legitimate ones, objection to crossing savors, in my judgment, of prejudice the most profound, or quackery the most unvarnished. The cry, "buy full-bloods," with such men, generally means, "buy *our* full-bloods!" It is neither convenient, nor within the means of every man wishing to start a flock of sheep, to start exclusively with full-bloods. With a few full-bloods to breed rams from, and to *begin* a full-blood flock, the Southern breeder will find it his best policy to purchase the best common sheep of his country, and gradually grade them up with Merino rams. In selecting the ewes, fair size, good shape, and a robust constitution, are the main points—the little difference that exists between the quality of the common sheep's wool is of no consequence. For their wool they are to look to the Merino; but good form and constitution they can and ought to possess, so as not to entail deep-rooted and entirely *unnecessary* evils on their progeny.

* This occasions the want of uniformity in the Rambouillet flock in France, which was begun by a promiscuous admixture of all the Spanish families.

† Quoted in Letter X.

I have already spoken, in this Letter, incidentally, of the effect on the fleece of the common sheep, by crossing with the Merino and breeding steadily toward the latter; and also of the mutton of this cross, as well as that of the Merino and the English breeds. The result of the cross with the common sheep has been sufficiently described. I would add a few remarks in relation to that with the South-Down and Leicester —both of which I have tried until sufficiently satisfied with the result. Resolved on making an experiment with a Down and Merino cross, a few years since, and finding it difficult to obtain Down ewes* of the proper quality, I obtained a small, compact, exceedingly beautiful, fine and even-fleeced Down ram,† and crossed him with a few large-sized Merino ewes. The half-blood ewes were bred to a Merino ram, and also their female progeny, and so on. The South-Down form and disposition to take on fat manifested itself, to a perceptible extent, in every generation which I bred,‡ and the wool of many of the sheep in the third generation ($\frac{7}{8}$-blood Merino and $\frac{1}{8}$-blood Down) was very even, and equal to medium, and some of them to good medium Merino. Their fleeces were lighter than the full-blood Merino, but increased in weight with each succeeding cross back toward the latter. Their mutton of the first, and even the second cross, was of a beautiful flavor—and it retained some of the superiority of South-Down mutton to the last.

I at the same time purchased a few Leicester ewes,‖ and, as in the preceding case, taking one cross of the blood, I bred toward the Merino. The mongrels, to the second generation (beyond which I did not breed them) were about midway between the size of the two parent stocks—with wool shorter, but far finer and more compact than the Leicester—their fleeces about the same in weight as in the present stocks§—and altogether they were a showy and profitable sheep, and well calculated to please the mass of farmers. Their fleeces lacked *evenness*—their thighs remaining disproportionately coarse and hairy; and making up my mind that this would always be a tendency of the sheep of this cross, I abandoned them without farther experiment.

In relation to the number of crosses necessary before it is proper to breed from a mongrel *ram*, there is a difference of opinion. Mr. Livingston says :¶

"It is now so well established as not even to admit of the smallest doubt that a Merino in the fourth generation, from even the worst-wooled ewes, is in every respect equal to the stock of the sire. No difference is now made in Europe in the choice of a ram, whether he is a full-blood or a fifteen-sixteenths." . . . . "The French agriculturists say that however coarse the fleece of the parent ewe may have been, the progeny in the fourth generation will not show it."

I am constrained to differ with even this high authority. I admit that the only value of blood or pedigree, in breeding, is to insure the hereditary transmission of the properties of the parent to the offspring. As soon as a mongrel reaches the point where he stamps his characteristics on his progeny, with the same certainty that a full-blood does, he is equally valuable, provided he is, individually, as perfect an animal. But I do not

* To carry out the commonly received principle in breeding, that in crossing between different races, the ram of the smaller should be put to ewe of the larger one.

† This ram, obtained from Francis Rotch, Esq., was got by a prize ram of Mr. Ellman's, and from one of his choicest breeding-ewes, and showed infinitely more style, as well as fineness and evenness of wool, than the common Downs of our country. He was not larger than a large-sized Merino ram.

‡ These I finally put off to save myself the trouble of breeding several kinds of sheep on the same farm.

‖ Descended from the flock of the late Robert Adcock, of Otsego County, N. Y.—considered at the time equal to any flock in the State.

§ That is, about 5 lbs. I have put down the Leicester fleece, in my description of the breed, at 6 lbs., as this is the amount generally claimed for them; but in the few cases brought within my direct knowledge, they have never averaged it. My ewes above alluded to did not, I think, average quite 5 lbs.

¶ Essay on Sheep, pp. 181, 183.

believe that this can be depended upon, with any certainty, in rams of the fourth Merino cross. My only experience in this particular is in the observation of other men's flocks who have bred with high-grade rams.* These have invariably lacked the style and perfection of thorough-bred flocks. The sixth, seventh, or eighth cross might be generally, and the last perhaps almost invariably, as good as pure-blood rams, but I confess I should still prefer to adhere to the latter. Pure blood is a fixed standard, and were every breeder to think himself at liberty to depart from it, in his rams, each one more or less, according to his own judgment or caprice, the whole blood of the country would become adulterated. No man would be authorized to sell a ram of any cross, be it the tenth, or even the twentieth, as a full-blood.

It is all-important for those *commencing* flocks either of full-bloods, or by crossing, to select the choicest rams. A grown ram may be made to serve‖ from 100 to 150 ewes in a season. A good Merino ram will, speaking within bounds, add *more* than a pound of wool to the fleece of the dam, on every lamb got by it, from a common-wooled ewe.§ Here is one hundred or one hundred and fifty pounds of wool for the use of a ram for a single season! And every lamb subsequently got by him adds a pound to this amount. Many a ram gets, during his life, 800 or 1,000 lambs! Nor is the extra amount of wool all. He gets from 800 to 1,000 half-blooded sheep, worth double their dams, and ready to be made the basis of another and higher stride in improvement. A good ram, then, is as important, and, it seems to *me*, quite as valuable an animal as a good farm-horse stallion! When the number of a ram's progeny are taken into consideration, and when it is seen over what an immense extent, even in his own direct offspring, his good or bad qualities are to be perpetuated, the folly of that economy which would select an inferior one is sufficiently obvious.

Every one desirous of starting a flock will find it his best economy, where the proper flocks to draw rams from are not near him, to purchase several of the *same breed*, of course, but of *different strains of blood*. Thus, ram No. 2 can be put on the offspring of No. 1, and *vice versa;* No. 3 can be put upon the offspring of both, and both upon the offspring of No. 3. The changes which can be rung on three distinct strains of blood, without in-and-in breeding close enough to be attended with any considerable danger, are innumerable.¶ But if these rams of different strains are bought promiscuously, without reference to similarity of characteristics, there may, and probably will be differences between them, and it might require time and skill to give a flock descended from them, a proper uniformity of character. Those who breed rams for sale should be prepared to furnish different strains of blood with the necessary individual and family uniformity.

* I have never knowingly bred with any other ram than a pure-blood, of any stock, or for any purpose.

‖ By methods hereafter to be described.

§ That is, if the ewe at 3 years old sheared 3 lbs. of wool, the lamb at the same age will shear 4 lbs. of wool.

¶ The brother and sister are of the *same* blood; the father and daughter, half; the father and grand-daughter, one-fourth; the father and great grand-daughter, one-eighth, and so on. Breeding between animals possessing one-eighth of the same blood, would not be considered very close breeding; and it is not uncustomary, in rugged, well-formed families, to breed between those possessing one-fourth of the same blood.

The Highest Fountain in the World is in the grounds of the Duke of Devonshire, at Chatsworth, where a single jet is thrown up to a hight of 267 feet—more than 100 feet higher than Niagara Falls.

THE HOUSEWIFE'S DEPARTMENT.

We are resolved that, for the future, this department of The Farmers' Library shall be punctually kept up. Every farmer may be supposed to have a wife, and, if not, the sooner he gets one the better for him, if he would thrive and do well—*provided* she is at once docile and spirited, cheerful and resolute, neat, industrious and economical. Without meaning to flatter, and with no inconsiderable opportunities when younger to learn how rural life is conducted in this our republican country, where every man gives his time to party politics we have often had occasion to observe that happiness and success depend quite as much on the wife as the husband—and even more, in so far as they are connected with the care and the manners of children, and all the nameless but important details of in-door management generally.

Have we not in our youthful days—days of alternate smiles and tears—of holidays and school-days—been scolded and coaxed into giving our aid and comfort to the women-folks, in a thousand ways—helping now to wind the yarn, and next to "pick" the cotton? to drive up and count the geese and the turkeys? to *smoke** and to feed the chickens? Have we not been forced, on Saturdays, with a heart full of sadness, and the sense of its unfairness, to forego squirrel-shooting and rabbit-hunting, to carry the "filling-in" to the weaver, and the leather to the shoemaker? Have we not lent a hand in drying peaches, and even in dipping candles? and, if the truth must be told, have we not stolen the water-melon from the patch, and the milky roasting ear from the corn-field—and even the rising cream as it floated, in all its delicious freshness, on "four-and-twenty" milk-pans "all in a row?" Not so much, be it confessed, because some of them might not have been easier come at in an honest way; but, then, *we* thought they all tasted *so much sweeter!*—for be it known that, in all these boyish peccadilloes, we had our confederates, both white and black—(blessed be their names! for most of them have gone beyond that bourne "whence no traveler returns.") And is it not wonderful how company *does* embolden us in wrong-doing? Even whole nations, feeling might and forgetting right, have been known sometimes to perpetrate robbery and murder, for which any individual among them would be quickly swung up by the neck? But we are becoming grave when we only meant a jocose reference to youthful pastimes and occupations, to show that personal experience gives us a right to pretend to some knowledge of rural life and its affairs; and the more so, since there are some who would fain look on us as interlopers in the very field of inquiry and observation to which we have chosen to fly all our lives, for occupation and amusement, whenever we could break or slip the bridle, and escape from school or from the labors of office, and the more artificial scenes and circles of the town.

We shall not, however, ask the judgment of *men* upon what we shall every month supply for the entertainment and welfare of the thrifty housewife and the anxious mother. When the boy returns from the neighboring Post-Office, the chance is that the gentleman of the house will take the post-bag, and, first of all, cull from it *his* party paper, with a foregone conclusion that whatever

* An effectual process for curing the "gapes."

he there shall find is gospel, to be swallowed and followed, even though it may load his country with debt and dishonor. We speak, of course, of no particular party. Well, good lady, let him take his hebdomadal dose of politics—which habit has made as necessary as his tobacco—while you, in your habitual and appropriate deference to his better judgment in such things, ask for THE FARMERS' LIBRARY AND MONTHLY JOURNAL; and after reading, as you find it worthy, call to your own department the attention of your dear daughters, single or married. We can promise you, at least, that you shall meet with nothing there that does not inculcate the practice of all the womanly domestic and Christian virtues—industry, economy, and attention to cleanliness and cultivation of body and of mind—such virtues, in a word, as have made illustrious the names of a Comtesse de la Fayette and a Madame Roland, a Mrs. General Greene or a Mrs. Hill.*

For this month we take, with other items, what we find at hand in the "*Quarterly Journal of Agriculture and Science*," being a familiar story of "MR. DUROPUS AND FAMILY." The melancholy fate of poor Duropus is a very natural representation of that of many honest farmers who are brought to ruin by the improvidence of their wives and families; while, truth to tell, a yet greater number are broken up by their own laziness and contaminating associations. It may safely be affirmed that the extravagance of wives is not unfrequently occasioned by *want of confidence and candor* on the part of the husband—as if the blood of Portia were extinct, and as if American might not, as well as Grecian and Roman matrons, be trusted, even unto death. Alas! have not too many of them, as well in the time of our Revolution as since, had occasion to say and to realize the sad presentiment of Andromache:

"Be careful, Hector! for with thee my *all*—
My father, mother, brother, husband fall!"

From a false, though it be an amiable pride, and unwillingness to deny their family every gratification, husbands would conceal their inability and embarrassments, until too late to retrieve their affairs; and only when on the very verge of inevitable ruin, is the dreadful disclosure made—accompanied, perhaps, with lamenting extravagances which an earlier and better knowledge of his condition would have prompted the wife to avoid at every sacrifice; for who is she, worthy of the sacred office of wife and mother, who is not ready to unite with her husband in every struggle and self-denial, to preserve for him and her family that greatest of all earthly blessings, *independence!* however humble the condition and the sphere of its enjoyment?

* In no spirit of invidious preference do we venture to add the name of this native lady of our own State, whom we remember as a little school-girl. Reared with tenderness, in the enjoyment of all that easy fortune and parental fondness could supply—married young, and widowed in early life, she was left with a family of sons to rear and educate, and a large estate and complicated affairs to manage. With a fortitude and perseverance which has characterized so many of her countrywomen, she brought up her boys in a high sense of honor and obligation to preserve the purity of their name, and handed them over their estates unembarrassed and improved. Have we not a right to draw the names of such women from retirement and in this department proclaim their examples for the emulation of their sex? Nay more: is it not a scandal to our country that some man duly accomplished and imbued with the true spirit for the task, has not sketched for American Biography the lives of American women, of whom our Revolutionary and other times could boast so many conspicuous models of conjugal devotion, of enlarged philanthropy and heroic resolution under the most trying exigencies of fortune? It shall be our pleasing duty to preserve such sketches in the Housewife's Department of THE FARMERS' LIBRARY, when offered. Where the materials are so abundant, shall the chivalry be wanting to supply them?

MR. DUROPUS AND FAMILY.

CHAPTER I.

One Friday evening, as Mr. Duropus came in from the field, he found his house in especial fine order, and all the labors with which he was wont to close the day anticipated.—This was certainly a very pleasant fact, and not a very unusual one in the history of his experience. It was commonly followed by a demand, on the part of Mrs. Duropus, upon a leathern purse which lay in a small chest, under the bed, in which (the purse, not the bed) was deposited gold, silver, and bank-notes, received in exchange for beef, pork, hay, oats, potatoes, apples, and other commodities produced by the farm of sixty acres, owned and cultivated by Mr. Duropus.

When the supper table was removed, and the girls had gone over to the next neighbor's, and Mrs. Duropus had lighted her candle and threaded her needle, (which last feat was not performed till after divers nippings of the thread with her eye-teeth, and many fears that Mr. Duropus would repeat a remark, not at all pleasant, "you had better take your spectacles,") and had commenced repairing a rent in her husband's coat. When all these important things had taken place, Mrs. Duropus began to expatiate on the prosperity and fine appearance of their neighbors, the Dashiels. "Only to think," said she, looking up from her work by way of emphasis, "how well they have got along in the world. Two or three years ago, when they came into the village, they had nothing at all, and now there is not a family in the place that dress better; I do n't know of a single family that has got along as well as they have."

"Mr. Hardy's family have got along better, to my notion," said Mr. Duropus.

"According to your notion; but your notions are different from those of most persons."

"When Hardy bought that run-down farm, four years ago, he paid two hundred dollars down, and gave a mortgage for eight hundred. Since then he has managed to pay one hundred and twenty-five dollars a year, besides the interest, and to make the farm worth double what it was when he took it. He will soon be out of debt, if he lives, and be the owner of a fine farm."

"How has he done it? He has n't allowed his family the comforts of life."

"I think you hardly do right to say that.—The house is about the neatest one I have been in, and the children look as plump as partridges."

"I presume they have enough to eat. As to the house, I suppose you have never been in any room but the kitchen. Their parlor has nothing in it but the bare floor and walls, a table and a few old chairs."

"I can't say how that may be; I was in the room they live in, and, if anything, it was more comfortable than this one."

"There is no need of our living in this room," Mrs. Duropus was tempted to say—but, remembering the object in view, she suppressed the remark. The good lady, together with her three daughters, had simultaneously conceived the idea that it was ungenteel to live in the kitchen. Hence, when in company, they spoke of it as a dim and shadowy land, into which they rarely made excursions. They were too well acquainted with Mr. Duropus's notions, to make any attempt to dislodge him from the time-honored corner, or to make their own residence in the 'front room' other than theoretical.

"I presume," continued Mr. Duropus, after a brief interval of silence, "that Mr. Hardy feels that he can't afford to furnish a room which is so little used as a parlor is, while he is in debt, and has so many improvements to make on the farm."

"That is always the way with you men. There are so many improvements to be made on the farm that the house can never be made decent inside. Every old barn and rail-fence and ditch must be fixed first."

It was plain that Mrs. Duropus was losing sight of the object for which the house was put in extra order, and losing something of the pleasantness of her voice; she perceived it, and made an effort to repair the error, but her feelings were too much interested in the topic we have mentioned, to leave it without a few more remarks. She moreover hoped she might give them a bearing which might tell on her as yet secret purpose.

"If he has some excuse for not furnishing the house, he has no excuse for letting his girls go dressed as they do."

"I do n't know much about such things, but they always look very nice at home and abroad."

"It behooves those who have only one or two frocks to keep them clean."

"I should think it would be harder work to do so, and therefore they deserve the more credit for it."

"I do n't think their father deserves much credit for laying out so much on his farm, and making his daughters do with only a dress or two."

"I do n't know how many they have, I 'm sure; they always appear well dressed at meeting."

"They have worn the same dresses at meeting, and everywhere else they have been, for a year; and will do so, I suppose, a year longer."

"It may be, and, if they are kept nice, I do n't see why they should n't."

"I do n't suppose *you* do, but other folks do; I reckon you would like to have the girls wear the same dresses, Sabbath after Sabbath, for a year."

"I should stand a better chance to know them when I meet them than I do now. The other day, as I was going to neighbor Hardy's, I passed a smart-looking young woman with a good many ribbons flying. I thought she noticed me as I passed, though I did n't know her."

"Where has Phebe Maria been?" said one of the girls.

"She has n t been anywhere to-day, as far as I know," said I.

"You must have met her, for she just went by here."

"I remember I passed a young woman, but I did n't mind who it was," said I.

"I think it is pretty well," said Mrs. Hardy, "if a father do n't know his own daughter." They had quite a laugh about it.

"I suppose you joined in with them," said Mrs. Duropus.

"I rather think I did laugh some."

"I do wish you would n't run down your own children, or, what is just as bad, let other folks do it. The Hardys need not say anything. I do n't think that one of them has had a new thing for six months past."

"I do n't believe they have," said Mr. Duropus, with a quiet smile; "you would certainly have known it if they had; but do you think they are less respected on that account?"

"If parents wish to have their children be anybody, they must have them do as other folks do."

"I rather guess, mother, that neighbor Hardy's girls will make out as well as any of the girls in the place, after all."

"They may, according to your ideas of making out well. They may marry men like their father, whose hearts are set on improving their farms, instead of making their families comfortable."

Mr. D. made no reply to this remark. A cloud passed over his good-humored countenance. What were his thoughts as he sat gazing at the place where, in winter, the fire was wont to glow? Was it strange that the phrase, "they may marry men like their father," struck him unpleasantly? Would it be a calamity to them if his own daughters should marry men like their father? Did their mother regret that she was wedded to one whose notions differed so much from the new ones she had adopted? He had toiled under the scorching summer sun, and amid the storms of winter, to gain the means of rendering his family comfortable. Was this unappreciated? True, Hardy was the man spoken of, but his own views and practice had not differed materially from those of his neighbor. But thoughts like these were soon dismissed. "She has been," thought he, "a faithful and loving wife; when we began the world with nothing, she did her full share of the labor; true, now, some of the notions which are filling everybody's heads, in these days, have got into hers; but she will get over them, when she comes to think more about them." He felt pained at the thoughts which he had indulged. By way of atoning for the same, he determined to grant the favor, whatever it might be, which he saw his wife was preparing to ask at the commencement of their conversation. He rubbed his face, and changed his position, and talked on various topics so cheerfully and pleasantly that Mrs. Duropus was emboldened to prefer her request.

Mr. Mason, a merchant in the village, had just returned from the city with a fresh supply of goods. In the fullness of his benevolence, he had informed Mrs. D. that he had procured certain dress patterns, with especial reference to the adornment of her daughters; and that, in expectation that she would purchase the same, they should be withheld from the public eye till noon the next day. Mrs. D. was authorized by her relenting husband to make the purchase on the following morning.

CHAPTER II.

Let us now look in at Mr. Hardy's. It was about ten o'clock in the morning; Mrs. Hardy and her two daughters, Mary and Jane, were busily employed in the labors appropriate to their calling. Occasionally the sweet voices of the girls might be heard in song, and then in an affectionate dispute with their mother relative to the division of labor. A knock was heard at the front door. Instead of fleeing in various directions, and slipping on dresses, whose rebellious folds clearly indicate the suddenness of their appropriation, Jane continued at her work, and Mary went to the door. She found there Miss Phebe Maria Duropus, and a young gentleman (the brother of the minister) who was spending his vacation in the village.

"Good morning," said Mary, with a slight want of composure at the sight of the stranger —"walk in!"

"We were making a few morning calls," said Miss Phebe, after she had introduced Mr. Foster, "but perhaps you are engaged."—This was spoken while she was still standing before the door.

"We are not more engaged than usual; we are always happy to see our friends. Come in!" said Mary.

They entered, and Miss Phebe seated herself on the edge of a chair; whether through fear of soiling her new dress, or because she thought it more genteel, is not known.

"You are very industrious," said Miss Phebe Maria, "I wish I were so."

"We are obliged to be; so we do n't deserve any credit for it."

Jane came in without waiting to be inquired for; and after a very few moments spent in labored conversation, and after amusing herself by tapping on the bare floor with her sunscreen, and then becoming very ostentatiously conscious of the impropriety of the act, Miss Phebe Maria rose, saying that they must not hinder their friends from their work, and bade them good morning. Mr. Foster bade them good morning with rather more politeness and respect than was quite agreeable to Phebe Maria.

"Phebe seems to be very friendly, all at once," said Jane with a smile, after they had resumed their operations in the kitchen.

"There was n't too much friendship in her call to-day," said Mary, slightly vexed.

"Do n't be harsh in your judgment, dear," said Mrs. Hardy.

"It is n't a judgment, but a fact. She brought him here to let him see that our house was not as well furnished as hers."

"She took unnecessary trouble, then," said Jane; "she might have told him about it."

"I suppose she thought that seeing is believing," said Mary. "If he is a sensible man, I do n't think she has gained much by bringing him here."

"Let us talk about something else, dears," said Mrs. Hardy, and the suggestion was cheerfully adopted.

Not long after this call, Mr. Foster presented himself at the door, unattended by Phebe Maria. "Are the young ladies at home?" said he to Mrs. H., who came to the door.

"Yes, sir—walk in! They are at home, and will be ready to see you in a few minutes. They are now helping their father milk the cows, or rather he is helping them. Mr. Hardy has so much to do that, when we can get the cows home soon enough, we try to have them milked before he comes; that is, the girls do, for they won't let me go out of the house."

"You have n't them under very good government. then," said Mr. Foster, smiling.

"It is n't the fashion now, you know. The fashion now is for the young folks to rule and the old ones to obey. However, I can't complain of my girls—they try to do everything they can for their parents; only they won't let me do as much as I wish to sometimes.—I do n't like to see them do it all."

The girls had new finished straining the milk, and, as the labors of the day were over, some slight changes were made in their dress, and they came in and passed the evening with Mr. Foster. He had no such horror of uncarpeted floors, or of industrious girls, as to prevent his staying till the village bell "tolled the hour for retiring."

It appeared that one of Mr. Foster's uncles, with whom he spent a part of his time, was well acquainted with Mr. Hardy, and highly appreciated his character. He had requested his nephew to make his acquaintance, during his stay in the village. Perhaps he thought he was fulfilling that request by becoming acquainted with the daughters, for the nine o'clock bell rung before he inquired for the father, and then he had gone to bed. So it was plain that it would be necessary for him to call again. He did so, and the necessity for repetition seemed to be increased, insomuch that Miss Phebe Maria, on one occasion, said that, if any one wished to find Mr. Foster, they must look for him in Mr. Hardy's kitchen.

CHAPTER III.

"Mr. Duropus, our girls must have more things. It don't signify; they can't be anybody unless they do."

"What is wanting now?" said Mr. Duropus, who looked thinner and older than when we saw him last.

"We must have an ingrain carpet, and some mahogany chairs, and a looking-glass: everybody has them now. Even Mr. Hardy has got his girls a carpet."

"He can afford to do so, but I can't."

"What is the reason? Your farm is as large again as his."

"And my debts are as large again, and more too, for I don't know as he owes a cent in the world. When he owed eight hundred dollars, I didn't owe much if anything; and now he is free from debt, and I have just as much as I can do to pay the interest, and I shan't be able to do that long at the rate we are going on."

"I do n't see how that can be. We have not bought anything for the girls but what was necessary. They have only had what other folks have."

"I do n't know how that may be; they have had more than I can afford. I ought to have refused and put my foot down at the first of it, and got only what I could afford to get."

Mrs. D. was silent. She was not given to profound reflection, and hence had never thought what effect her demands on her husband's purse might have in the end. She was sorry if he was embarrassed; and yet she could not believe it. The girls had had next to nothing. Old-fashioned folks were prone to exaggerate, where new things were concerned. He could surely afford the carpet and chairs. She would do without something herself. The girls would be married soon, that is, if they had suitable things to attract husbands with. With such thoughts did she fortify himself in the resolution to persevere in her application; and who ever heard of a persevering wife who was denied.

The money was raised by a mortgage on his stock, and the carpet, chairs, and *glass* were purchased. Mr. Duropus excused himself for yielding, by saying to himself, "I shall have no peace till I do."

About two years after the above-mentioned purchase, Mr. Hardy came one day to the field in which Mr. Duropus was hard at work. "Good morning, neighbor," said he, "I have noticed for some time that you have n't looked well. You work too hard; you can't stand it."

"That is n't it; I 'm in debt, and expect to have all my stock sold before long."

"I concluded you must be in debt some—and—I—was rather surprised at it, too."

"That is, you thought I had too much sense to give way to the foolish ways that are ruining half the farmers in the country."

"Yes, that is about it, seeing you have said it yourself."

"Well, you see, I got into it by little and little, and once in, it is hard swimming against the tide. I shall never get out of it. I shall see the last of my farm if I live many years longer."

"You must get out of it; your duty to your family requires it."

"They have got the upper hand now; if you could persuade them to make a change, I might save myself."

"You certainly can persuade them, if you tell them just how you are situated."

"I have told them many a time, and there is a crying-spell and a reform for a day or two, and then the old story over again."

Mr. Hardy felt too deep an interest in the welfare of his neighbor to leave matters in their present state. He inquired into the amount of his debt, and proposed several ways by which he might extricate himself.

"What good would it do? I should get right in again."

"Not if you will just make up your mind to buy nothing except what you can afford to buy. I have five hundred dollars that I had thought of giving to my son-in-law, Foster, to get him a library, but he can do without for a while. I will give you that for the wood-lot and pasture adjoining, and pay off the mortgage bonds; and then you will have more than sixty acres and free from debt, and if you can't keep out then, why I don't know what can be done for you."

"There can't be anything done for me, unless I do for myself. I'll take up with your offer, and will follow your advice to the letter, come what may. Let us go and draw writings. I want a good night's sleep, a thing that I have n't had for months, and shan't have till I am out of debt."

Lyed Hominy.—Every housewife knows that there are *two* kinds of hominy, the "small" and the "great" hominy; but all do not know that there is a *third*, which, though less known, is the easiest prepared, and in Missouri, where it is much used and esteemed, is called Lyed Hominy, for a reason that will be obvious. It is prepared, says a Missouri housewife, by boiling the white field-corn in *ashes* and water until the husk or skin of the grain is loosened, which will happen in a few minutes, and attention must be paid that it remain not too long in the ashes, else it will taste of the lye. So soon as the husk is loosened, it must be washed and rubbed through the hands, in cold water, until the grain is cleansed from the ashes and husk or bran. It may then be dried, to be used at any time, or boiled immediately, if wanted. When wanted to be cooked for the table, it must be scalded and then put to boil in plenty of water, observing always to keep sufficient hot water to throw in as the first boils down. The grain bursts into a white ball, and becomes soft when sufficiently done. This is the manner of boiling to eat it, either warm or cold, with milk, or cream if to be had, even fresh Alderney cream! This preparation of Indian corn is also used in the West, by the Indians and Creole boatmen, who prefer it to anything else in a *soup*, which they prepare by putting the lyed corn to boil, with a piece of beef or pork, leaving the water in, which makes the soup. In the other case of the lyed *hominy*, the grain, when done, is separated from the water. There can be no doubt that a bowl of this lyed hominy and fresh milk would have been as keenly realized by old Rough and Ready, after the battle of *Buena Vista*, as "a dish of nice strawberries smothered in cream" by us who live at home at ease, and read with admiration of his stoic fortitude and, with a too sanguinary *gout*, the accounts of all his hard-fought battles.

To have Good Coffee.—Few things so often test the skill and attention of the housewife as the *quality of her coffee*. The proverbial excellence of French coffee is owing to its being roasted (or scorched) *slowly* over or near a moderate fire, thus concentrating the aroma or essential oil, instead of rapidly burning the berries, thereby evaporating its high flavor. To make good coffee, when it is boiled, and not percolated through a biggin,

"it should boil up once only, and then it should be suffered to stew [simmer] in a close vessel or pot on the hob—the longer the better—until wanted, when it will seldom require fining; for which purpose, however, a little pounded isinglass is the best. In France, and most other countries, the berries are mostly fresh scorched or roasted, just before being required, which, in nearly all families, is performed in the frying-pan (rarely in a roasting machine) over a slow fire of charcoal, the berries being kept moist by the addition of a little fresh butter or lard, which prevents all possibility of burning. They are turned out, when finished, on flannel, and rolled up closely till cold."

Then it should be made *very strong*, and drank, half coffee, half cream or boiled milk. Some ladies barely *color the water*. That may do for children, but not for those who know "what 's what," and that 's what the great Pinkney said General Ridgely knew, when he wanted to praise him and his knowledge of what was *comme il faut*.

TRANSACTIONS OF THE MASS. HORTICULT. SOCIETY.

FRENCH METHOD OF PRESERVING FRUITS.

"Civilization bids us mingle the ornamental with the useful; and the pleasures of the eye, although not so indispensable, are of a much more refined nature than those of the mouth."

If any one doubt the truth of this sentiment, so well expressed in these "Transactions," let him but ask himself where his lady-love would be seen with greatest force of attraction—tending her tulips and training honeysuckles, or munching the most aromatic and delicious fruit that ever grew? But our thanks are due, in the first place, to the distinguished President of the Society, for a copy of this specimen of their Transactions—published, as all such works should be, in a style worthy of the beautiful art to which they are dedicated. Beautiful as this volume is, however, it seems to have not yet satisfied the just pride of the Society; and, in truth, in respect of the chromolithing process employed in the exhibition of the flowers and fruits with which the work is embellished, although the best display of that process which has fallen under our notice, it is not in its present state to be relied on, to realize the design of those who arrange these Transactions, and who seem to judge that nothing has been well done which can be done any better. Hence the Trustees intimate a determination not only to bring out their subsequent volumes in a superior style, but that the plates now given shall be reproduced, with every practicable improvement.

Referring first to what it has ever been our disposition to hold up for example in all such cases, we have to notice the fine, liberal spirit which has ever prompted the members of this Institution, both as a body and individually, to stimulate and encourage the formation and the success of all such associations in other parts of the country—rightly judging, contrary to the feeling and practice of some similar Associations, that there are cases in which a common public good is best promoted by honorable and extended rivalry, and the wide diffusion of appropriate knowledge.

After arguing that Floriculture may eventually become an object as well of profit as of amusement, and suggesting the patronage of it as a suitable object to attract the surplus wealth of the tasteful and opulent, a striking fact is adduced to show the commercial value into which the products of Floriculture may be made to grow, as in the case of the two exquisite seedling Camellias—the "Camellia Wilderii," and the "Camellia Mrs. Abby Wilder,"—the figures of which adorn the volume before us. These were obtained in the conservatory of the President, M. P. Wilder, Esq., by the persevering application of the art of hybridization laid down by Herbert. Mr. W. sold his stock of these two seedlings to J. L. L. F. Warren, for $1,000, and Mr. Warren has since nearly tripled that amount for them in Europe. But we have no room for more remarks, even if they were needed to hold up the enlightened management and choice fruits of this Association to the emulation of men of taste and means throughout the country. The love of Horticulture, with which sordid ideas of gain are not usually associated, may not be so easily imbibed in a country where the "almighty dollar," as Irving calls it, is the object of universal and eager

pursuit; yet to all reflecting minds it holds forth this inducement—that, as stated in this volume, "examples are exceedingly rare of men, once engaged in Floriculture, ever giving it up but with their latest breath." While it offers elegant recreation to the man of wealth, to the poorest it is not forbidden.

In making room for the practical matter which follows, to the exclusion of as much already prepared for this number, we propose to show to our friends of this intellectual, prosperous Association, that in our case their kindness has not been lost on the wayside, at the same time that we put in for them a claim to the gratitude of our readers.

"The following simple statement of the number and varieties of Pears contributed at the last four annual exhibitions will confirm the foregoing impression:

	1843.	1844.	1845.	1846.
From M. P. Wilder, Pres't, about	91	102	120	154
Messrs. Winship	47	50		40
Pomolog'l Garden, Salem.	160	159	240	176
Samuel Walker	13		36	45
Ebenezer Wight	21			
Otis Johnson	32	24	35	41
J. L. L. F. Warren	34			34
J. S. Cabot		43	60	74
Josiah Lovett, 2d		15	68	23
Hovey & Co.			17	18

The beauty and qualities of these Pears cannot be represented by numbers, but those who saw and tasted them can bear witness to their great excellence in these points, and the large number of sorts will show the pains that have been taken to put all on trial for the purpose of making selections best suited to this climate.

The perseverance in cultivating many varieties, of high character elsewhere, which at first do not appear to thrive in this section of the country, deserves notice, as it has been rewarded in several instances by successful acclimation, and has given rise to the decision that Pears should not be rejected without a fair trial of four or five successive seasons.

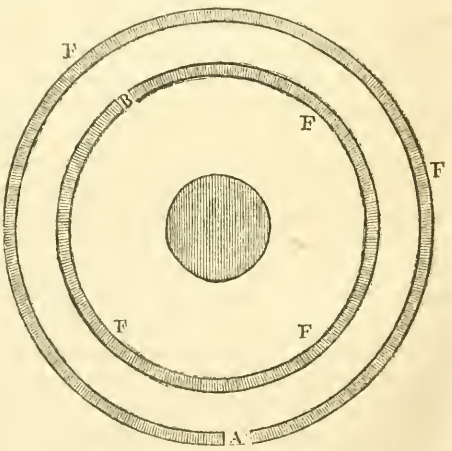
Equally interesting statements respecting Apples, Grapes, Plums, &c., might be drawn up, but this is sufficient for present purpose.

As the experience acquired in the cultivation of these must of course be extensive, its wide dissemination is certainly of great importance; and the same is true of another object, that is, the method of keeping Fruit in the most perfect state throughout the winter, particularly apples and pears.

Mr. Victor Paquet, of Paris, published a little work on this subject in 1844. He gives an extract of the printed award of the Royal Society of Horticulture of Paris, decreeing a medal to him; this states that M. Paquet had on the 12th of June exhibited one hundred pears and apples, and that those the judges tasted had perfectly preserved not only their beauty, freshness and flavor, but even their perfume. In one year he preserved 17,000 apples and 11,000 pears: the finest of these latter fetch sometimes 3 fr. (60 cts.) each in the Paris market.

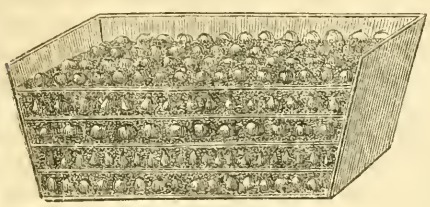
His method, although at first expensive, deserves to be known. His fruit-house is a circular building expressly for this purpose, with an outer and inner wall, as will be seen on reference to the figure below. The hight and thickness of the walls, as well as the dimensions of the house, are with him arbitrary. The distance between the two walls is about three feet six inches; both have windows, as he thinks a diffused light preferable to entire darkness. The inner room is, of course, the depository of the fruit, and the object here is to attain a constant temperature of about 50° Fahr.; as low as 39° would not be injurious, but 66° to 73° destructive. The intervention of fire-heat he considers very prejudicial.

He has a number of tight wooden boxes made with drawers, of oak—which wood he prefers, as being easier to be cleaned from the remains of any fruit which might decay; softer woods allow the moisture and seeds of fungi, causing decay, to sink into their open pores, where they remain and vegetate another season. In these drawers the fruits are placed, with small intervals between each, on a slight bed, one-sixth of an inch thick, of saw-dust (not pine, which would communicate an unpleasant flavor), highly dried in a baker's oven, eight parts, and one part of very dry pulverized charcoal; and with this mixture the interstices between the fruits are



Ground Plan. A, B, doors; F, windows.

filled to about two-thirds of their hight, leaving one-third exposed. M. Paquet discusses at some length the various substances generally used to envelop fruits, such as moss, cotton, paper, &c., and finally gives the preference to the mixture mentioned, objecting totally to wrapping each in paper.



FORM OF THE BOXES.

Previous, however, to depositing in the fruit-house, many precautions should be taken; the fruit should be gathered with the greatest care—the slightest bruise or pinch would be fatal; the fairest and finest specimens must be selected. It should be gathered about ten days before it is ripe, but must have attained its full size; after gathering, should be left in an open, airy situation for about fifteen days, to sweat, and on no account be wiped—previous to its final deposition in the boxes in the fruit-house. With all this care some will decay; the boxes should, therefore, be occasionally looked over, and those showing the slightest symptoms of perishing be immediately removed.

Mr. Paquet's small publication contains many valuable hints on the preservation of fruit on the trees; on the acceleration and retardation of the period of ripening, and on the artificial means of increasing the beauty and coloring of Fruit.

Our winter and summer climate, however, differs so much from that of Paris, that judgment must guide our operations here; to follow implicitly all his ideas might lead us into error.

The writer has received a communication from an American friend in France, who is enthusiastically devoted to rural pursuits, which states that their Apples in France are abundant and good, and many kinds keep well, although he has eaten none which he thinks equal to those here; but he adds:—'Their Pears are truly magnificent, and their St. Germains are even now (April, 1847) in eating; Fruit, however, in general, is enormously dear—I paid yesterday four cents for an ordinary Pear, and a franc, or twenty cents, was the price demanded for one of superior size and quality. The markets for Flowers are held here several days in a week, and certainly are extremely beautiful. I attended, the other day, a magnificent exhibition of Flowers and Greenhouse Plants, made for the benefit of the poor. The display was certainly most brilliant.'

It is presumed that these Transactions may be rendered of equal value to the agriculturist as to the horticulturist; for the Fruits on which they will chiefly treat and offer information are those the cultivation of which employs a portion, sometimes a large portion, of many well-conducted farms.

Of the number of barrels of Apples consumed at home, no approximative calculation can be ventured on, but every one is aware that it must be enormous; and even the export of this fruit is rising into importance as a trade—from Boston alone, in 1845, 10,229 barrels, and in 1846, 11,092 barrels, were exported. That the production has not yet overwhelmed the consumption is evident from the fact that prices rather tend upward than downward, while the supply of the finest sorts by no means equals the demand. How necessary, then, that the public should have some authentic source to look to for information respecting the cultivation of these fruits; and how imperative on the Massachusetts Horticultural Society, under the weight of the liberal patronage bestowed on it, to become that source.

The commercial value of the Pear, although it has not yet attained the same importance as that of the Apple, has lately received a vast impulse; nor can there be the least doubt, when our Pear orchards shall have been sufficiently enlarged, and the method of keeping this fruit have improved, that a great demand for export to the West Indies and South America will arise, and a valuable addition to our trade be developed."

While the caution against difference of climate cannot be too strongly impressed, there can yet be no doubt that the cultivation of fruit, as an object of commercial operations, is to form a not unimportant item in our machinery of exchanges, of all of which the land is the basis. The love for fruit, and the habit of consuming it, is one of those which grows by what it feeds on. When Dr. Underhill commenced the sale of grapes on a small scale, the demand was reluctant and limited: now it is not easy to supply it; and he, too, has had the good sense and feeling to diffuse, all in his power, a knowledge of the means of conducting this attractive branch of Horticulture. Less than forty years ago, as we are told by Gen. Dearborn, there was scarcely a nursery in New-England worthy of the name, while now there are many that contain nearly as great a variety of

fruit trees as the most extensive in England and France. Let us lay claim, *en passant*, to the fact of having added one to their stock—the *Shepherdia* or "Buffalo Berry"—received in Baltimore, while Editor of the American Farmer, from an officer in the West, and sent, many years ago, to Mr. Winship. We have often stated to our friends in the South, who are not ashamed of sending to northern nurseries for the commonest fruit trees, that in New-England, now, nothing is more common throughout the country than for nurseries of common fruit trees to be sold by the farmer to the regular nurseryman, to be by him budded and grafted, with one or two hundred per cent. added to its value, and then sold a second time to the provident farmer in the South!

If the habit of consuming fruit, in its natural and prepared state, is thus increasing in the North, how much faster yet would it increase, under the same means of encouragement and indulgence, in the South, where the climate itself demands a larger proportion of vegetable over animal food! But we have exhausted our borrowed space for a subject which, besides its intrinsic merit, has for us its peculiar attraction, and to which we shall again and again recur—using this occasion no farther than to add that success might well be predicated of an Association which came into existence under the Presidency of General H. A. S. Dearborn, whose elegant and various acquirements and cultivated taste have been so often and effectually displayed for the benefit of the kindred pursuits, Agriculture and Horticulture, to which The Farmers' Library is dedicated.

Catch the Scoundrel!—The Salem Observer says that some sacrilegious hound has robbed the old and time-worn Endicott Pear Tree, the present season, of its crop of fruit.

Mr. Editor: The extract above reminds me of a paragraph in The Tribune of the 5th of May last, in which it is stated that the Stuyvesant Pear Tree, at the corner of Third-avenue and Thirteenth-street, which was brought from Holland in 1647—two centuries ago—"is, no doubt, the most ancient fruit tree on this continent;" which is undoubtedly erroneous—for, ancient and venerable as this honored memorial of bygone days really is, both tradition and the records indicate that it is not the *oldest* of its kind among us.

The Endicott Pear Tree, alluded to above, it is believed was brought from England in 1630, and is *known* to have been set out by Gov. Endicott, in his "orchard" in Salem, now Danvers, Mass., in 1632; and, consequently, is at least 15 years older than the Stuyvesant Tree. It annually bears its share of fruit, although the hand of Time has made great havoc with its fair proportions.

The Cuca.—Prescott, in his "Conquest of Peru," says that this is a shrub which grows to the hight of a man. The leaves when gathered are dried in the sun, and, being mixed with a little lime, form a preparation for chewing, much like the betel-leaf of the East. With a small supply of this cuca in his pouch, and a handfull of roasted maize, the Peruvian Indian of our time performs his wearisome journeys, day after day, without fatigue, or, at least, without complaint. Even food the most invigorating is less grateful to him than his loved narcotic. Under the Incas it is said to have been exclusively reserved for the noble orders. If so, the people gained one luxury by the Conquest; and, after that period, it was so extensively used by them, that this article constituted a most important item of the colonial revenue of Spain. Yet, with the soothing charms of an opiate, this weed, so much vaunted by the natives, when used to excess, is said to be attended with all the mischievous effects of habitual intoxication.

G. & W. Endicott Lith. N. York.

FIVE YEAR OLD AYRSHIRE COW.

New York, Published by Greeley & Mc Elrath, for the Farmers Library; J.S. SKINNER Edt.

AYRSHIRE CATTLE;

WITH A PORTRAIT OF A FOUR-YEAR-OLD COW.

In what country are farmers more interested than in ours, in being well informed as to the qualities of different races of cattle, and in breeding them carefully with a view to the preservation and improvement of such as best comport with their particular objects and interests? Some there are whose profit from cattle consists almost exclusively in the cheapest production of beef—some who rely for income on their yield of milk, or butter, or cheese, while some, and much the greatest number, who do much of their farm team-labor with oxen, and who would combine with that object milk, and butter, and beef, to a certain extent. The farmer, then, as do all sensible, reflecting men engaged in any other business, should endeavor, by inquiry and by observation, to inform himself how, and by the adoption of what breed, his *chief purposes may be best accomplished.*

If the merchant orders a ship to be built, he well knows that attention must be paid, not merely to the qualities of her timbers, but to her model: if he wants her to make quick voyages, with perishable cargoes, to run the gauntlet through a blockading squadron, or for the barbarous uses of privateering and war, he explains all to his ship carpenter, and he frames her accordingly, what they call clipper-built, of a model that, as Admiral Cockburn once said to us, about the Baltimore Clippers, in the time of the War, "Why, Sir, your clippers take the first of a nor'-wester and, running down in the night, *whiz* by us like wild ducks, before we have time to cut our cables." If, on the other hand, he wants a ship to carry a great freight, she, too, is modeled after that intent. In all other pursuits except farming, *mind is exercised.* First, the end is considered; then the most appropriate and economical means. There is a certain plan marked out, and the best means of fulfilling it well digested and perseveringly adhered to. Now is this the habit, this the precaution of American farmers generally in breeding their domestic animals? Far, very far from it: with them, commonly, a cow is a cow, a sheep a sheep, and a hog a hog—whereas, do not the breed and qualities of his domestic animals concern the farmer in the degree that the manufacturer is interested in the structure of his machinery, and the merchant in the model of his ship, and the tanner in the qualities of his bark? If, then, there be any use in advising, we would recommend all to consider, not superficially, but anxiously, and with all the lights they can collect, the primary objects which their position invites them to keep in view, and making these the chief, while others are the subordinate considerations, never buy, or turn out a breeding animal, without reference to these objects. A farmer should be as well acquainted with the breeding and promises of his young stock, as the merchant with his stock in trade—his bills payable and his bills receivable—or the smith with the nature of his iron or his coal.

In this country, at present, we have of the imported and popular foreign breeds, the Ayrshire, the Devon, the Short-Horn, the Alderney, and the Hereford, with grades of them all. Some of these we have ourselves imported, others we have owned, many years ago; and with the best specimens of all profess to be familiar,

by extensive reading and personal observation. Without the shadow of motive for partiality, we shall relate, from time to time, as we can find room, what is said, what we know, and what we believe of them all. If in our impressions we are mistaken, all we have to say is, that "to err is human." Yes, we have this to add, that, far from presuming to censure, or complain of any difference of judgment, we are always grateful for the expression of opposing opinions by men who think with freedom, and who, like gentlemen, speak accordingly. And first of the AYRSHIRE. We have not room or time to refer to the different importations that have been made. We saw those which were imported some years since by the late Allen I. Davie, selected by himself in Scotland, and landed in Baltimore. They passed into the hands of JOHN RIDGELY, Esq., and were sent to the celebrated Hampton estate—where, as we have understood, they have given great satisfaction as dairy stock. He not being now in the country, it is not in our power to ascertain more particularly; and besides, he belongs to that category of gentlemen farmers who, though always ready to welcome a friend to the enjoyment of his elegant and ample hospitality, and to give, personally, every information he possesses, does not find his greatest pleasure in a minute survey of his agricultural operations, any more than in the trouble of writing down what he knows. But it takes "a good many kinds of people to make a world;" and these gentlemen farmers, full of hospitality and intelligence, yet afflicted with the *pen-phobia*, form a class, we are sorry to say, somewhat too numerous—for, where much is given, much ought to be expected. Then came Dr. Hoffman's importation of Ayrshires, some years since, but at a much later period. These have passed—some of them, at least—together with some sent out by McHenry Boyd, Esq., from England, into the hands of Mr. McHenry, in Hartford Co., Maryland; who, on trial, entertains the highest opinion of their value for the dairy—and if we may form an opinion of his judgment, in such cases, by such specimens as we have seen of his dairy products, there need be no better.

We are under the impression—but of that we shall soon be better informed—that, some years past—not a few—there was an importation of Ayrshires into Massachusetts that did not tend to establish it as a popular breed; for what reasons we are not now exactly informed. On the other hand, the very fact that such an Association of well-informed, disinterested, judicious, inquiring, and thinking men as the Trustees of the Massachusetts Agricultural Society—(for we are disposed to lay great stress on the importance of *grounding action on thought*)—the very fact, we say, of such men, having the means to be employed and the license where and what to choose, sending for Ayrshires and North Devons, would of itself be, with us, *prima facie* evidence of the eligibility of the choice, for their purposes. On this point we find the following reasons in what we deem an authentic exposition of their views:

"The breeds of cattle which the Trustees believed, under all the circumstances, to be best adapted to this country, best calculated to promote the object they had in view, and to subserve the wishes and wants of the farmer, were the Ayrshire and North Devon.

The Ayrshire cows have been, for nearly or quite a century, distinguished as deep milkers, and at the same time are known to be a hardy, mild-tempered and docile race—easily kept, with a disposition to fatten when not in milk, and having a capacity of converting their food to milk beyond that possessed by any other breed of cows in Great Britain.

The venerable Aiton, who may be justly styled the pioneer and champion of improved husbandry in Scotland, and particularly of that branch which relates to dairy stock, says: 'The Ayrshires are the most improved breed of cattle to be found in the island, not only for the dairy, in which they have no parallel under similar circumstances, but also in feeding for the shambles. They are, in fact, a breed of cows that have, by judicious

selection, cross coupling, feeding and treatment, for a long series of years, been brought to a state of perfection which fits them, above all others yet known, to answer in almost every diversity of situation where grain and grass can be raised to feed them, for the purposes of the dairy, or for fattening them for beef.'

In the dairy establishment of Mr. Harley, at Glasgow, consisting of 150 cows, they were principally of the Ayrshire breed, to which he gave a decided preference over any other breed. The average quantity of milk given by the cows in his establishment, for the year, was eleven quarts per day from each."

As to their "*disposition to fatten when not in milk*," that, we apprehend, is in proportion to the predominance of the Short-Horn blood; and whether the accession of that blood is not made at the expense of the milking property, will depend upon whether it is derived from a milking or a beef family of that race. Some of the Ayrshires we have seen—Mr. Davie's, and a cow we saw at Saratoga—wore the appearance of miniature Short-Horns: and such is the character of the portraits of Ayrshire cows as we sometimes see them represented. For ourselves, if called on to make a selection, we should lean to the *Alderney* side of the house, as it is exhibited in the Plate we give, and in the Ayrshires imported by Dr. Hoffman. We have not seen the Massachusetts importation, but that is no reason why we never should.

Looking for the origin of this race, we have not in reach any more recent or authentic account than we find in Low's splendid work on the Domestic Animals of Europe—of which the only English copy we have seen is in possession of Lewis Morris, Esq., near Fordham, Westchester County. Referring now to the French translation before us, we find it there stated that authentic documents are wanting to designate the progressive steps which have been followed, with the milch cattle of Ayrshire, to bring them to their present conformation. Culley, who wrote his work on Cattle before 1790, makes no particular mention of Ayrshires. Aiton, who in 1825 published a treatise on the Dairy Husbandry of Ayrshire, describes their cattle, according to his own observations, as being a sorry, ill-formed race, without any superiority over those which then existed in some of the mountainous districts. The cattle were then, as he informs us, generally of black color, with white marks on the face, back and flanks. Few of the cows gave more than from one-half to two gallons of milk a day, after calving; and weighed, when fatted, 20 stones—meaning, we presume, 14 pounds to the stone, or 280 net. But, says Mr. Low, according to the French translator, since that epoch the blood of the primitive Ayrshire has been mixed with other races. It is, says he, established on competent authority that, in the middle of the last century, Count Marchmont introduced, on his estates in Berwickshire, a bull and many cows of the Teeswater, then known under the name of the Holland or Holstein breed, which were supplied to him by the Bishop of Durham. Divers other proprietors introduced foreign breeds of cattle, probably of the same race, on their estates. One cannot say with certainty what was the influence exercised by these accidental importations (we are re-translating Mr. Low) on the primitive race of Ayrshires. Tradition even ascribes to an anterior importation of cows of the *Alderney* race, in the parish of Durham, the first remarkable ameliorations which occurred with the cows of Ayrshire and in the produce of their milk.

This opinion, says Low, in which we entirely agree, is justified by the resemblance which exists between the Alderney race and the modern Ayrshires; and which is so obvious that, even without the tradition, one would be led to believe that the blood of the two races had been mingled. One remarks, in fact, in the two races, the same kind of horns and the same color of the skin. In a word, the general conformation presents such a striking analogy that we might often

be led to confound the Jersey with the Ayrshire cow. Thus, in spite of the absence of authentic documents to this effect, one may affirm that the *milking* race of Ayrshires owes the characters which distinguish it from the ancient race to its cross with the English races derived from the Continent, and with the milking race of Alderney.

Mr. Low proceeds to describe the Ayrshire, as illustrated in the portrait prepared for this number. The modern Ayrshire, he says, may occupy the fifth or sixth class, as respects hight, among the races of Great Britain. The horns are small and turned in at the extremity, as those of the Alderney. Their shoulders are light, while they are large and deep across the loins—a form which is most generally met with in deep milkers. The skin is moderately soft to the touch, and of a yellow orange color, which is also seen on the eyelids and udder.—The predominant color is a reddish brown, mixed more or less with white. The muzzle is ordinarily black, but often flesh-colored. The limbs are lank, the neck small, and the head exempt from coarseness. The muscles of the internal parts of the thighs are thin, and the haunch droops at the tail—a characteristic equally of the Alderney, and which, though it destroys the symmetry of the animal, is not considered as incompatible with an aptitude to an abundant secretion of milk. The teats are of middle size and sufficiently firm. The cows are very tame and docile, and sufficiently hardy to do well on the most ordinary food.—They give a great quantity of milk, in proportion to their size and the food they consume, and their milk is of excellent quality. When in good heart on grass pasture, they give 800 to 900 gallons in the year; while as to the younger and less productive, 600 gallons may be considered a good medium produce for the whole herd of cows in the low country, and sometimes a less average for the entire herd of cows in the mountains.

Few of this race of cattle are raised for beef, and the male calves are sold to the butcher, either at the cow's foot, or after having fed for a longer or shorter time on milk. When the cows go dry, they fatten promptly; but the great merit of the race is in its fitness for the uses of the dairy. The attention of breeders being exclusively turned to this point, the animals have acquired, in an eminent degree, qualities of that kind; and their exterior qualities present all the characters that indicate this particular disposition, more than those which denote an aptitude to early maturity and to fat. Furthermore, those, says Low, who suppose that the Ayrshire race unite the properties of milch with those of beef cattle, entirely confound the distinctive characters of the two. The Ayrshire occupies the first rank among dairy cattle, but they deserve an inferior place among cattle designed for the butcher.

The Ayrshire race has been much spread over the counties around its original region of country, where good milkers belong. It now forms the predominant herds in Renfrew, Dunbarton, Stirling and Lanark, and has extended in the counties of Dumfries, Wighton and Kircudbright. The Ayrshire has been carried into England, but has not there preserved the reputation it enjoys in its original pastures. All cows succeed best in the localities where they have been raised; and those of Ayrshire appear to have this particularity—that they have a great tendency to fat, and to undergo a corresponding diminution in the production of milk, when transported where the herbage is richer than that to which they have been accustomed. They have been tried in the great milk establishments in London, but have been there always abandoned for Yorkshires and larger races.

Some raised in the county of Ayr have been crossed with the Short-Horn breed. This process is useful, perhaps, in some particular cases, because the first cross is always larger than the maternal stock in size, conformation and disposition to fatten, and scarcely inferior in the production of milk; but it cannot be of general advantage thus to replace or supersede a race, the characters of which are now so uniform and so well appropriated to the Agriculture of the country. The true method of amelioration consists in preserving the race in the purity it possesses, and by adopting some mode of treatment and of nourishing which may augment its valuable qualities and improve its conformation. Already, in the course of our age, the weight of the Ayrshire has almost doubled, and its aptitude to give milk has been much augmented; with the future progress of Agriculture its melioration cannot fail to be progressive.

Such is the history, such are the qualities, of the Ayrshires, as given by very recent and very high authority. We find we must postpone, for want of room, what we had proposed to add, as to their milking properties and the cost of them, on the authority of Mr. Colt of Paterson, Mr. Colman, Mr. Norton, Mr. Phinney, and last, if not least, on our own observation. Throwing aside all speculation, the facts, when collected, may present a statement interesting to all who are curious (and what farmer of true spirit is not?) to know what is said of all the different races, by men enjoying the best opportunities to describe and estimate them.

It is not to be doubted that, by nice discrimination in choice of individuals, and great and skillful perseverance, a breed excelling, for any given purpose, might, after a long series of years, be formed out of our native stock; but, with those who would contend that there is nothing in breeds, we can only stop now to ask, how he would like to take his chance to get out of a Conestoga wagon mare, a hunter that would take him over a five-barred gate, and tail the pack in pursuit of an "old red"?

As one of the first questions in these cases is, naturally, as to the *cost* of things recommended, we add a short extract from a letter just received from R. L. Colt, Esq., to the Editor of The Farmers' Library:

"My Ayrshire bull cost me £40 sterling in Ayr—making, to get him here, $300. The cow cost £19, and stood me in $200. Devon cows cannot be imported short of $200 each. A bull will come at $300; Alderneys the same. My friend N. Biddle imported an Alderney bull and four cows that cost him $1,500. My Alderneys are of his stock. I would not sell an Alderney cow short of $150. I sold two Devon cows this fall at $100 each, and a heifer at $75."

ROAD MANURE.—Turnpikes and roads in general are formed by running a plow along their sides, and after the earth is loosened by several furrows, it is scraped into the middle of the highway by oxen or horse-power, having a ditch or gutter at each side, two or three feet wide, and from one to two feet deep. These ditches are often completely filled up with fine rich mould (completely black), which is highly surcharged with the very essence of the road and of the adjacent grounds, having been washed thither by melting snows and teeming showers of rain. If the gutters are level, or only of a gentle descent, they will require no attention in order to manure; but if the water flows through them with a rapid current, it will be necessary to make small dams across them every few rods to prevent the escape of the sediment that drags along their bottoms.

There is an objection, however, for the farmer to interfere in this manner with any public highway, as it would render him liable to prosecution and the payment of all damages which might accrue. If he could obtain permission, from proper authority, to deposit an equal quantity of good gravel for every load of manure he might take away, the difficulty would be removed, and he could enrich his land at his own expense. J. S.

CHARCOAL—LIME—MARSH-MUD COMPOST—SALT AND STABLE MANURE.

To seduce you, gentle reader, into the perusal of what follows, we have eschewed the stereotyped heading, "POTATO ROT." We have, as you will bear witness, carefully avoided adding to the *quantum suf.* on that subject—for, in truth, what could we hope to say new, or to discover, either preventive or curative, on a topic which had baffled the investigations of such men as *Kane*, and *Playfair*, and *Lindley*, and *Liebig?* and, yet more, which had survived the original and erudite essays from the Patent-Office, comprising more than 100 pages of its famous Report?

We, however, conclude to give the following observations by Dr. Moorman, the Consulting Physician at that attractive and delightful summer resort for the recovery and preservation of good health, the WHITE SULPHUR SPRINGS, in GREENBRIAR.

We can speak for the Doctor's zeal as an amateur agriculturist, and, if it had been possible to accept his hospitable invitation to visit "FANCY HILL," could have been enabled the better to judge how far his success as a practical *farmer* corresponds with his well-known skill as a *practicing physician.*

JOHN S. SKINNER, Esq. FANCY HILL, Virginia, Nov. 2, 1847.

Dear Sir: Believing that any information tending to throw light on the *Potato Rot*, or in any way to mitigate its ravages, will be interesting to you, and may be beneficial to the community, I take the liberty of stating a fact that has just come under my observation, and which, so far as I know, has not been heretofore noticed.

In the spring of the present year, I broke up and planted in potatoes an acre lot, which, for several years, had been covered with a heavy grass sod. Near the center of this lot, a *coal-pit* had been burnt about twenty years ago, and at this time the ground where it stood is quite blackened with the coal-dust and small pieces of coal. We are just engaged in digging the potatoes in this lot, and find a very large proportion, perhaps two-thirds, either partially or entirely rotten, *except those that grew on the site of the old coal-pit;* and there they are uniformly sound and healthy, and completely free from every indication of disease.

The ashes deposited in burning the pit must long since have lost their strength, and I am, therefore, left to conclude that the preservation of the potatoes on the site of the pit was entirely owing to the charcoal which was freely interspersed with the earth.

We ought not to be hasty in forming a practical conclusion in Agriculture from a single experiment, however satisfactory such experiment may have been; but I respectfully suggest if the fact I have observed may not be so far worthy the attention of the potato-growers in districts where the rot prevails, as to cause them to have coal-dust or pulverized coal put in the hills or rows with the potato sets when they plant in the spring? And, farther, if it would not be well to bury such potatoes as are threatened with the rot in charcoal, with the view of preserving them for the use of stock during the winter and spring?

Very respectfully, Sir, your obedient servant, JOHN J. MOORMAN.

P. S.—Since writing the above, I have learned from my neighbor, Mr. Moffitt, who, like myself, has an old coal-pit in his potato patch, that he has found every potato that grew among the coal perfectly sound and healthy, while those in the balance of the patch were so rotten and worthless that he discontinued digging them after taking up a few bushels. J. J. M.

Well aware that Mr. Colt, of Paterson, had made various experiments with different substances, the preceding letter was submitted to him, and has been returned with the following remarks:

My Dear Sir: I return you Mr. Moorman's letter. In 1846 I tried charcoal-dust with potatoes, and also anthracite ashes, and thought with success. This year I tried several plans with my potato crop—some with charcoal, lime, and marsh-mud compost—some with lime—some with salt—some on virgin land without any manure, and some with stable manure. All had the rot, more or less; those planted early escaped best. Mercers were the most affected—Pink-Eyes some—Black-Skins not much, and Scotch Grays but little. Even potatoes raised from seed did not escape. I had some chocolate-colored Kidneys not affected at all. The thick-skin potato seems to escape the rot best; and those early planted were

much less diseased than the late planted. Only those last planted rotted in the ground.—Some of the early showed signs of decay in three or four days after digging them. I put some, as soon as dug, into charcoal bins, but it did not save them; and I have come to the conclusion that the disease is atmospheric, and, like the cholera, will work its course, and after a year or two we shall be able to raise good crops again. Next year I shall plant fewer potatoes, and more beets, carrots and parsnips.

From all I can learn, our potato crop in New-Jersey will not be a half-crop, and I think it will be safe for you to estimate the crop throughout the country at that rate; and it is said that the rot has extended to sweet potatoes. I mean to go largely into Jerusalem artichokes for hogs the next year.

THE "SCHOOL OF APPLIED CHEMISTRY" AT NEW-HAVEN.

ITS CONNECTION WITH PRACTICAL AGRICULTURE.

> "Providence would only initiate mankind into the useful knowledge of Earth's treasures, leaving the rest to employ our industry, that we might not live like loiterers."

It is with no ordinary pleasure that we announce the opening of this School, and hail its establishment as another and a decisive step in the forward march of public sentiment, demanding, more and more emphatically, *express education* for Agriculture, as for other arts and pursuits.

This School is attached to the Department of Philosophy and the Arts in Yale College, with B. Silliman, Jr., as Professor of Chemistry and the kindred sciences applied to the arts; while J. P. Norton is the Professor of Agricultural Chemistry.

The instruction in the Professorship of Agricultural Chemistry, about which we feel most immediate concern,

"Is intended to unite, as much as possible, practical views with theory; to give the untaught farmer an opportunity to become acquainted with so much of Science as shall enable him to reason upon his daily pursuits, and to understand the great principles upon which good cultivation must depend. A course of Lectures will be delivered in the winter of each year, commencing in January and continuing about two months, there being four Lectures in each week. The subjects of the course will be: the composition and nature of the soil, the plant, and the animal—theories of rotation of crops, and of feeding—modes of draining—the different kinds of manures, their value and how beneficial—the improvement of waste lands. &c. &c.

"In connection with the Lectures will be a short course of Elementary Chemistry, for such as wish to study somewhat more of Chemistry than is given in the course, and to qualify themselves for making ordinary testings and qualitative examinations of soils, manures, &c."

The introduction of this new branch of instruction is an experiment which appeared to be called for by the juster views which begin to prevail as to the true nature and dignity of this pursuit. It remains now to see whether farmers will give due encouragement to an enterprise which looks directly to the elevation and improvement of their character and position in the circle of national employments, and we rejoice to learn that already the signs are favorable.

We feel authorized to say that it will be the aim of Professor Norton to make his Lectures as practical as possible, to the end that farmers shall be divested of the too prevalent idea that to understand and profit by them, they must devote themselves to the regular study of Chemistry. On the contrary, the design, as we understand it, will be to give them a plain, comprehensive course—not to puzzle them with hard words or to confuse them with theories requiring a scientific education to understand them. In a word, the purpose is to explain the great principles on which all proper cultivation depends, in such a manner that

they may be perceived and comprehended by all men of sound education and understanding.

We regarded it, at the time, as a most favorable omen that Mr. Norton should have self-imposed the labor, time and expense of another visit to Europe, for the benefit of more ample experience in their laboratories, always in actual exercise, and conducted under the guidance of men renowned alike for their honorable ambition and acquirements, wherever Agriculture has a friend or Science a votary.

Notice has been given that those who desire more exact information may apply directly to the Professors above named. We have only to repeat our felicitations that American Husbandry seems to be at last about to receive that aid which Science has been affording so long and so effectually to less important branches of art and industry, and to tender the pages and facilities of this journal, as far as it can be made to bring about a "consummation so devoutly to be wished."

THE WHEATLAND INSTITUTE.

It is at once a matter of gratification and duty to call attention to the following announcement of an Institution in which we feel confident the course of instruction will much more nearly approach what is needed for agriculturists than those which are pursued in ninety-nine cases out of a hundred to prepare the sons of farmers and planters for the occupations and duties that await them.

Besides being a graduate and Assistant Professor of Mathematics, of highly respectable standing, at West Point, Mr. Turner is known to us as a gentleman of estimable character, conscientious views, and honorable ambition to be useful, having a lofty sense of the responsibility which attaches to all who undertake the great trust of *forming the mind and character of those who may be committed to their charge.* The locality is healthy, the position accessible, and the guaranties of kindness, attention and discipline, such as parents may naturally desire and ought to covet, and may, we are quite sure, fully confide in for their sons.

We say nothing of the military part of the institution, being thoroughly persuaded that for the landed interest it were better, isolated and secure as we are, not to engage in wars, or to waste time and substance in preparing for them. What men have incurred the expense and imbibed the spirit to prepare for, they are very apt to carry out. With the military science for the direction of military force, when invasion comes we are persuaded the Institution at West Point is adequate, and that this Republic has no occasion for standing armies, which always beget wars, pension lists, and privileged classes who fatten on the honest labor of the country and consume the wealth that ought to be reëmployed in its own reproduction—in multiplying the facilities of industrial exchanges and augmenting the population and happiness of the country. In fact, we are thoroughly prepared to believe in the language of a work that will, if we are not greatly mistaken, soon make a profound sensation among thinking men, that

"The Past says to the Sovereign of the Present: 'If you would reign over a great nation, avoid war, and labor to promote the growth of wealth.'

"To the Representatives of the land: 'If you would have your properties increase in value, avoid war, and labor to promote the increase of population and wealth.'

"To the People it says: 'If you would acquire the power to act and think for yourselves,

to determine how you will employ your faculties of body and mind, and what, for yourselves, shall be the disposition of the proceeds: labor to prevent war and waste.' "

We speak here for the landed interest of the country, to which we are bound, heart and hand, without alluding to or caring about who happens to be in power or who out. It is to their immediate Representatives that the *farmers* should look to save them from wars, pensions and taxes.

But to return to the Wheatland School: if it only succeed according to our wishes and persuasion of its excellence, it will fully realize the highest hopes and expectations of its founder.

To J. S. SKINNER, Esq. WHEATLAND, Jefferson Co., Va., Oct. 4, 1847.

My Dear Sir: It is no longer a question whether the agriculturist should be a man of science and of education. The idea that improvement is unattainable in this pursuit alone, that ignorance and blind adherence to established practices and old implements are the safest guides to the practical tiller of the soil, may now certainly be said to be exploded.

It has become a desideratum that is acknowledged and felt (as witness the munificent action of the public-spirited men of New-England) to introduce into our colleges and schools professorships intended for the instruction in his trade and the enlightenment of the mechanic, the farmer, the man of labor.

Have we no spirit of the same sort farther south? Are we content still to neglect our trades—to associate labor and ignorance, and thus to assign to those pursuits which are in truth worthy of the highest respect, an inferior place? I hope that a better spirit and juster views prevail among us; and I therefore propose, with the countenance of my fellow agriculturists, to establish upon my farm in Jefferson County, Virginia, an institution peculiar, so far as I know, in character, and of which the following shall be the features, viz: the West-Point course of instruction in Mathematics, and in the Natural Sciences; the Dead and Modern Languages, for such as may desire to learn them; the drill of the soldier as taught at West Point; and, for such as desire it, a course upon Agriculture, of which the object will be to hasten and extend the introduction of improved implements and varied crops, to which purpose a sufficient portion of my farm will be allotted. Being a graduate of West Point, and having served several years in the Army, (first, for a period, as an Assistant Professor of Mathematics at West Point,) and for several years more recently and to the present time, as a practical and laboring farmer, I promise, if encouraged in this enterprise, to put into requisition whatever of experience or knowledge I may have acquired in these several favorable positions, and thus faithfully to endeavor to return, in some small degree, the peculiar debt which all graduates of the Military Academy owe to the country. Will you allow me to hope for your aid in the promotion of this object?

The school is already commenced and ready for the reception of students.

DUTCHESS AGRICULTURAL INSTITUTE.

We sincerely wish the same success to Mr. WILKINSON's "*Dutchess Agricultural Institute*," in regard to which we have the high authority of the Executive Committee of the New-York State Agricultural Society for saying, "This Institution is in successful operation, and is doing much good, and the Proprietor is about enlarging his buildings to meet the wants of the agricultural community;" and we take the opportunity to explain that a communication with drawings for a coach-house and stables was received some months since, and until recently mislaid. The drawings are in the hands of the engraver, and the whole will be published, with some comments, in an early number.—These are the last lines to be sent (15th Nov.) for the December number. A great variety of valuable matter is necessarily postponed.

NOTICE OF THE AGRICULTURAL INTEREST

BY MEN IN AUTHORITY.

We much wish we had time and room to note what may be said of Agriculture, and especially of appropriate education for it, by the Governors in their Annual Messages, and in the Reports of Agricultural Committees in the several States, the coming season. They will serve, in some measure, as indications of the progress of public opinion on this most important of all subjects of legislation. It will be our pleasure to commend to universal respect and esteem the examples of those who manifest their patriotic sensibility on this great and universal concern, as it will be our duty to reprobate the delinquency of men charged with the care of the common weal, who can have the ignorance or the hardihood to overlook it, as many do—as though Agriculture were an insignificant interest, with which Government has nothing to do but to neglect or—to *tax it*. Peruse, reader, the honorable evidence of enlightened solicitude for the Plow on the part of Governor Thorp, of Delaware. We have room only for a very brief extract—enough to show that he, at least, for one of the men in high places, has a true appreciation of what is due to the cultivation of the soil:

. . . "But while reviewing our own advancement as a State, in the general progress of Society, it is most useful, however mortifying it may be, to consider our deficiencies; and, therefore, my fellow-citizens will bear with me in earnestly invoking attention to the languishing condition of our Agriculture—the paramount interest of the State, and which, in the counties of Kent and Sussex, furnishes the chief employment, and constitutes almost the whole source of wealth. The early accumulation of lands into the possession of a few large proprietors left the soil to the cultivation of a dependent tenantry, who had no sufficient interest in its permanent improvement to stimulate them to its proper care and management. As a direct consequence, its productions, both in amount and quality, have fallen far below its real capabilities. The profits of agricultural labor have depreciated, and, in the decline of this interest, others also have necessarily participated.

"The equalizing processes of republican society have gradually broken up the large landed estates of former times, and our lands have fallen, in smaller parcels, into the hands of those who themselves till the soil, and who in becoming its possessors have acquired a permanent interest in its productiveness.—Hence a decidedly forward movement has been exhibited by our farming classes within a few years past. But the sluggishness, impoverishment and decay still visible in many places, show that our Agriculture yet labors under the depressing effects of the old system of large landholding, and claim for it the serious attention of the General Assembly.—Whether any, and what, measures of relief are within the sphere of legislative action, is matter for much consideration. It may be that, by a liberal course of legislation toward our farming interest, and *especially by so directing the education of the young as to inspire a love of agricultural pursuits, exciting to a careful study of the resources of the soil and of the best modes of cultivation and improvement, this great branch of Industry can be completely renovated.*"

SALTING MEAT.

SUGAR OR NO SUGAR—THAT IS THE QUESTION.

In the leading article of this number we have treated the subjects of Hogs and Bacon. We there expressed doubts about the benefit of sugar, as employed by many, in the process of curing meat, and also as to the necessity of *tight* vessels to retain the brine. Leaving these questions open, we deem it of importance to present the following from packers of high character and experience, in Baltimore, a leading market for provisions of all sorts. We

owe these valuable and instructive items to the never-failing kindness of Mr. GEORGE LAW, who recently forced upon the agricultural community, by indefatigable perseverance, a knowledge of the value and *use* of *guano*—which we had attempted and failed to do, by the distribution of two barrels of it in Maryland, in December, 1824, with an authentic analysis of its constituent qualities, and the application of it in Peru. But it requires energy and patience like Mr. Law's to show that "some things can be done as well as other some:"

LEWIS CASSARD is in the practice of curing hams by packing them in tight casks, and covering them with a pickle made of ground alum or Liverpool salt, to which he adds saltpetre and soda in the proportion of five pounds of each to every 100 gallons of pickle, of strength sufficient to bear a potato, in which they remain for 30 days, and are perfectly cured without the use of sugar, which he considers a humbug, and of no other use than to attract flies. Shoulders and middlings he cures in the usual way, by dry-salting on shelves, or on the floor, and permitting the pickle (deteriorated by use) to escape.

ISAAC REYNOLDS & SON cure the whole hog by dry salting and packing on shelves, or on the floor, and turning every three or four days. They also prefer the use of a little sugar as a decided improvement.

From the foregoing it would seem there is no uniform practice prevalent in Baltimore; and although I have no experience in the matter, nor has my opinion been asked, yet, as in prosecuting the inquiries I must have picked up some information, (to which you are perfectly welcome,) I will venture the opinion that dry salting in bulk, on shelves or on the floor, is preferable for shoulders and middlings, and that the use of tight casks is best for hams, as not liable to so great a pressure, and best preserving their shape and beauty, the whole without the use of sugar, as entirely unnecessary. (Signed) WM. PANTLOW.

—

Mr. SKINNER is informed that the best mode of salting pork is this, to say: after the hog is well cooled and stiff, then cut into suitable pieces, then salt well with Liverpool ground alum, or with Liverpool blown salt, by rubbing each piece well, using about 2 oz. saltpetre to every 8 pounds of salt, and 1 oz. pearl ash—mixing, if you please, all together in a salting-box, where the rubbing process is carried on; then place carefully in a box, cask, or shelf, as the case may be; let it remain two or three days in the salt, then change the top pieces to the bottom, rubbing well again with salt only. Some parties use sugar, to say: 2 pounds to every 100 pounds of hams or shoulders in addition to the saltpetre and pearl ash. It will do no harm, if the bacon is kept in a dry place and well secured from the bug and fly. It is more difficult to keep bacon where sugar is used, and in my opinion is of very little benefit, if any, to the meat. The saltpetre and pearl ash give the proper red color, and are good enough. The pearl ash has a tendency to redden the meat and prevent the fly and bugs from operating. I sometimes use a little country red pepper, well pulverized, that has the effect to prevent the bug or flies from operating, and is healthy. (Signed) J. B. EARLY.

PRINCE GEORGE'S COUNTY (MARYLAND) AGRICULTURAL EXHIBITION.—Rare good luck enabled us once more to shake hands, on that occasion, with old and cherished friends. We had intended, if time and room had been at command, to say a few words in praise, not flattery, of the nice displays of housewifery; of their magnificent region of country; and of the character of the Cattle-Show, as far as the county generally was concerned; but—"the least said 's the soonest mended." Take away what was sent there—the tasteful handiwork of the ladies, and the contributions of some four or so gentlemen of the county, the same old contributors—and where would have remained, on that ground, any proofs of the hearty zeal and progress of a county distinguished for its wealth, and high-breeding of men and women?

The gentlemen who came on their Arab steeds, with sword and buckler, will excuse the freedom of an old soldier in the cause of the—*Plow*, if we venture the opinion that they would have been quite as usefully employed in driving their cattle and their sheep to what was got up with great trouble by a *few*, and designed as an exhibition of *agricultural* industry. If their animals and implements were defective, so much the greater the merit in sending them, to evince what is wanting: no childish, ridiculous pride should restrain men of sense on such occasions. But, alas! how much more attractive is a red sash,

or a white plume, than an improved plow or a fine cow!—how much more charming for mankind the sound of the drum and fife, than the rattle of the wheat-fan, and the lowing of herds! We only wish it were as easy to pay the debts, pensions and taxes generated by wars, as it is to persuade sober agriculturists to give their time and means to military equipments and parades, who yet refuse to give a V for instruction, to their sons, of *inappreciable value* in the line of their future calling. For the rest, with the best possible wishes, we refer our friends to the reflections thrown out at pages 292, 293. We care not, and go not, for the time present, or for existing factions, any farther than they are connected with the *real and solid prosperity of the landed interest.* Truth will never offend a man of sense—nor even error, when conceived and propagated with good intent.

FAIR AT EASTON, MARYLAND.—We have heard nothing yet of the result. If not successful, the greater the reproach—for none know better than they, as to agricultural improvement, what has been done, what is wanting to be done, and how it should be done. We don't doubt, and shall rejoice to hear, that all was O. K.—that there was no hanging back, from false pride, from envy, from stinginess, or the fear of a little trouble for one day in the year.

PRICES CURRENT.

[*Corrected, November* 24, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47 .℔ 100 lb.	—	@	6 —
Pearls, 1st sort, '47	—	@	7 87½
BEESWAX—American Yellow	— 22	@	— 24
CANDLES—Mould, Tallow..℔ lb.	— 11½	@	— 12½
Sperm	— 31	@	— 33
COTTON—From.....℔ lb.	— 6¼	@	— 8¾
COTTON BAGGING—Kentucky	— 15½	@	— 16
CORDAGE—American.....℔ lb.	— 11	@	— 12
DOMESTIC GOODS—Shirtings, ℔ y.	— 5	@	— 9
Sheetings	— 6	@	— 15
FEATHERS—American, live	— 36	@	— 40
FLAX—American	— 8½	@	— 9
FLOUR & MEAL—Genesee, new, bbl.	6 12½	@	6 18¾
Oswego	6 —	@	6 06¼
Michigan	6 —	@	6 12½
Ohio	6 —	@	6 12½
Ohio, Round Hoop	— —	@	— —
Ohio, via New-Orleans	— —	@	— —
Pennsylvania	— —	@	— —
Brandywine	— —	@	— —
Georgetown	6 37½	@	— —
Baltimore, Howard-street	6 37½	@	6 50
Richmond City Mills	— —	@	— —
Richmond Country	— —	@	—
Petersburg	6 37½	@	— —
Rye Flour	4 50	@	4 62½
Corn Meal, Western and State	3 12½	@	3 25
Corn Meal, Jersey and Brandywine	3 43¾	@	3 50
GRAIN—Wheat, White....℔ bush.	1 30	@	1 37½
Wheat, Red and mixed	1 20	@	1 30
Rye, Northern	— 90	@	— —
Corn, Jersey and Northern yel	— 75	@	— —
Corn, Southern, yellow	— 75	@	— —
Corn, Western, yellow	— 75	@	— —
Oats, Northern	— —	@	— 50
Oats, Southern	— —	@	— —
HAY—North River in bales, ℔100 lb	— 56	@	— 60
HEMP—American, dew-rotted.. ton	140	@	150 —
" " water-rotted	160	@	190 —
HOPS—1847	— 7	@	— 8½
IRON—American Pig, No. 1	37 50	@	40 —
" Common	— —	@	30 —
LIME—Thomaston.....℔ bbl.	— 75	@	— 80
LUMBER—Boards, N.R., ℔M. ft. clr.	35 —	@	40—
Boards, Eastern Pine	— —	@	— —
Boards, Albany Pine.....℔pce.	— 12	@	— 21
Plank, Georgia Y. Pine. ℔ M. ft.	27 50	@	— —
Staves, White Oak, pipe. ℔ M.	57 —	@	58 —
Staves, White Oak, hhd.	43 —	@	44 —
Staves, White Oak, bbl.	34 —	@	35 —
Staves, Red Oak, hhd.	32 —	@	34 —
Hoops	20 —	@	30 —
Scantling, Eastern	16 25	@	22 50
Scantling, Oak	30 —	@	35 —
Timber, Oak.....℔ cubic foot	— 25	@	— 30
Timber, White Pine	— 18	@	— 25
Timber, Georgia Yellow Pine	— 28	@	— 32
Shingles .....℔ bunch	1 75	@	2 25
Shingles, Cedar, 3 feet, 1st quality.	26 —	@	30 —
Shingles, Cedar, 3 feet, 2d quality.	24 —	@	28 —
Shingles, Cedar, 2 feet, 1st quality.	18 —	@	22 —
Shingles, Cedar, 2 feet, 2d quality.	16 —	@	20 —
Shingles, Cypress, 2 feet	15 —	@	18 —
Shingles, Company	35 —	@	38 —
MUSTARD—American	— —	@	— —
NAILS—Wrought, 6d to 20d...℔ lb.	— 10	@	— 14
Cut. 4d to 40d	— 4⅜	@	— 4½
PLASTER PARIS—℔ ton	— —	@	2 50
PROVISIONS—Beef, Mess, ℔ bbl.	8 50	@	9 25
Beef, Prime	5 50	@	6 25
Pork, Mess, Ohio	15 —	@	— —
Pork, Prime, Ohio	9 75	@	9 87½
Lard. Ohio.....℔ lb.	— 9¾	@	— 11
Hams, Smoked	— 12	@	— 13
Shoulders, Pickled	— —	@	— —
Beef Hams in Pickle	10 —	@	11 —
Beef, Smoked.....℔ lb.	— 7	@	— 7½
Butter, Orange County Dairy	— 19	@	— 21
Butter, Western Dairy	— 14	@	— 16
Butter. Grease	— —	@	— —
Cheese	— 6½	@	— 7¼
SEEDS—Clover.....℔ lb.	— 7	@	— 7¾
Timothy.....℔ tierce	15 —	@	17 —
Flax, Rough	— —	@	— —
SOAP—New-York.....℔ lb.	— 4	@	— 7
TALLOW—American Rendered	— 9	@	— 9½
TOBACCO—Virginia.....@ lb.	— 2¾	@	— 7½
North Carolina	— —	@	— —
Kentucky and Missouri	— 4	@	— 7½
WOOL—Am. Saxony, Fleece,.℔ lb.	— 45	@	— 50
American Full Blood Merino	— 38	@	— 40
American ½ and ¾ Merino	— 33	@	— 36
American Native and ¼ Merino	— 28	@	— 30
Superfine, Pulled Country	— 33	@	— 35

G. H. W. Endicott, 36th N. York

TOBACCO PLANT AND ITS ENEMIES.

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TOBACCO.

ITS INSECT ENEMIES AND ITS CULTIVATION, FROM THE PLANT-BED TO THE HANDS OF THE SHIPPER.

We have chosen for the frontispiece of this number, the Tobacco Plant and its formidable enemies, the unicorn fly, commonly called by planters the horn-blower, and the worm proceeding from the egg which that fly deposits on the leaf of the plant, to be hatched, and then, like the silk-worm, to pass through a brief and gluttonous existence; feeding, night and day, on the substance and the hopes of the plant and the planter. Having rapidly attained its full growth, it buries itself in the earth, to be transformed into a loathsome grub, thence to reappear in brilliant attire, as here exhibited, for the last scene of its changeful career. With new and more refined taste, corresponding with its change of dress, it now luxuriates for a season on the sweets which Providence places for the support of insect life, in the blossoms even of the most loathsome weeds, and having finally indulged the universal passion, it deposits the fruits thereof where its own life commenced, and thus completes the round of its ephemeral existence.

The genus *Nicotiana* is an annual plant, flowering and ripening its seed in almost all parts of the U. S. and is yet cultivated for profit as far north as Connecticut, where its leaf is remarkably delicate and silky, with small fibres, and when cured rather of a dark cinnamon than of a bright color, and is understood to be used chiefly as wrappers of cigars.

Botanically speaking, this plant has a *funnel shaped corolla, with its border somewhat plaited, stamens inclined, stigma emerginate, capsule two celled, two or four valved.* The species *tabacum*, figured in the Plate, has its *leaves ovate, lanceolate, sessile, decurrent flowers panicled, acute.*

The Plate exhibits:

1st. The plant in blossom—

2d. The capsule—

3d. Ripe capsule, or seed-vessel opening at top, and,

4th. Transverse section of the capsule.

As to the character and habits of the worm and the fly, we have been for these to the foot of Gamaliel; and were there so fortunate as to obtain the following account from that distinguished planter, the *President of the Prince George's Agricultural Society*, and what is more and much better proof of practical excellence, the *winner, the past year, of the first prize for the best managed farm!* —a much greater honor, in our poor esteem, than if awarded for killing 1,000 guerrillas.

October 22d, 1847.

Dear Sir:—You were pleased to ask me for such observations in regard to the Tobacco worm as my actual experience enabled me to make. In compliance with that request I state the following facts.

The worm we see upon the Tobacco, and which does so much injury to that plant, increases in size rapidly, and in a few days arrives at full age for its exit from the scene of its then voracious activity. Instinct moves it to bury itself under ground to the depth of six or eight inches. In this self-made grave it undergoes a change, gradual (and perceptible to the naked eye) in all its variations, until it emerges into light once more, as a sort of butterfly, which we planters term "*Horn-blower.*" Of *this* you no doubt have an engraving. These "Horn-blowers" make their appearance about the middle of May. Then, every evening and morning, when it is cool, you see them flying about among the flowers of the garden, and sipping their nectar from the blossoms of every flower and weed, but particularly delighting in the tobacco blossom and the Jamestown weed. These Horn-blowers lay their eggs in myriads on the tobacco leaves,—not in clusters but *separately*, seldom more than one or two eggs in a place, and not often more than four or five on a whole leaf. In a fortnight or thereabout, these eggs burst and the contents are found to be an active little worm, hardly perceivable to the human eye unaided by a glass. By the time it is visible it has eaten a hole through the leaf about as big as a pin's head;—in a few days it will destroy pounds of tobacco in its green state. Its digestive organs are wonderfully active. It is constantly eating, growing in size, and discharging excrement, which is hard and black and round, resembling in size and form "Lee's Anti-Bilious Pills." It is a fact no less true than wonderful that this petty worm, never reaching to the weight of 2 oz. should, in ten or fifteen days, consume and digest 2 or 3 lbs. of green food. They make considerable noise when eating, after they have obtained a good size. What becomes of the butterfly or "Horn-blower" I do not know, and have no speculative theory on the subject.

I think they might, in a few years, be exterminated if every planter would pursue this course, to wit.: About the last of November or first of December, after hard frosts have set in, plow up, *very deep*, the field in which tobacco was grown the same year. Those that were in the chrysalis state would be turned out and destroyed by the frost, snow and rains. Very early in March go about the tobacco houses and dig up the floors, scrape under the sills, and plow for some distance around the houses, and *destroy* every one that can be seen. Make it also a point to reward liberally every negro, old and young, for each Horn-blower's head throughout the *whole* year. Let these rules be pursued by *every* planter and they could be exterminated. A gentleman of my acquaintance offered, the past season, one cent for every Horn-blower that his negroes should catch and bring to him. He allowed them one hour before sunset to stop work for the purpose of catching "Blowers." The first evening his people brought him in 1,650!!! Another paid, during the season, fifteen or twenty dollars at only a fourth of a cent a head. A capital farmer in digging about his tobacco house for the manure which had there accumulated, must have destroyed a bushel of worms in the chrysalis state. To show how plenty these insects are I here state the fact that I had in 1846 a piece of tobacco of 40,000 plants, and in two days there were gathered 16 bushels of worms from those plants, and *then* we thought that we had fully one-half or two-thirds of them. I have often seen a quart taken from one plant. These facts have been hastily thrown together; I hope they may be of some use to you.

Yours most truly, W. W. W. BOWIE.

To the above suggestion for the destruction of the worm we would recommend at least a limited trial with *salt*. The more recent experiments in England go to show great efficacy in the action of salt used for the destruction of grubs. We know not at what cost it can be applied in our country, but we have great confidence in its usefulness in that way when combined with the fall plowing recommended by Mr. Bowie. In a subsequent letter he says: "I have no experience in regard to *guano* on tobacco in the field;—in the *bed* it is a powerful assistant to the growth of the plants if used judiciously; but, to my dear bought knowledge, will, if used freely, destroy the plants. The proper mode is to use it in the liquid state —say one half bushel of guano to a hogshead of water; and when dissolved pour it over the plants, by means of a watering-pot. The result will be astonishingly beneficial."

One thing we would here suggest, to accelerate the growth of plants, that whereas a *black* surface is more absorbent and retentive of heat than a lighter one, if coal-dust of any kind could be sifted over the bed, it would increase the warmth and the fertility of the soil, and so forward the germination of the seed and the growth of the plant; and this suggestion may be useful where it is ne-

cessary to bring forward early plants, in the garden as well as elsewhere. In relation to the fly that attacks the plant in the bed, and which, with Mr. Bowie, we suppose to be the same as the turnip fly, we do not know that it will be in our power to say anything useful, but what we can say, shall appear in the February number—in time for any defence that can be made against it. This voracious and active little insect is estimated to have destroyed *half a million of dollars' worth* of turnips, in a single county of England, in one year.

Volumes have been written, pro and con, on the use and abuses of this very remarkable plant—remarkable alike in its history, its uses and its commercial relations—and especially in its serpent-like power to fascinate and overcome by its *charms*, of an indefinable sort, the disgust it is in most respects so well fitted to inspire. As we have anticipated by a month or more the season for sowing the seed, we may indulge here in some remarks relating to its original habitat and its chemical and medicinal properties, intending in subsequent numbers, and in good season, to present it in all the practical views connected with its cultivation and commercial value—not for the benefit of our friends in the old "Plantation States," who know it all "like a book," but because it may interest some who propose to embark in its culture, and yet more for the reason that in The Farmers' Library it is proper that the American cultivator should find, ready at his hands, memoirs, as full as need be, in regard to every important branch of Rural Industry.

De gustibus non disputandum—in plain English, there is no disputing about tastes; and though many of our readers may forego, and even abhor the use of tobacco in every form, the consumption of this delectable weed has nevertheless spread into all parts of the world; nor is there any, where the taste for it is so licentiously indulged as in our own, if we may believe the half that is written to stigmatize our habits, on this point, by travelers, male and female, who come *Trolloping* over our country, to seek what blemishes they may descry—and, alas! let us confess, aside, descrying but too many. To quote our own language twenty-seven years ago—

"In the whole Vegetable Kingdom, perhaps, no plant can be found, the propagation and effects of which have attracted as much notice, and produced so much excitement as this disgusting—some would say, fascinating weed. It has been alike the theme of poetical eulogy and the object of secular and political proscription. Popes have let loose their roaring bulls, and Kings have issued their decrees against it, and well would it be if Church and State would form alliance only on *such occasions*.

"Like some other narcotic poisons, however, tobacco has made its way against the denunciations of all its enemies, and becomes more dear and indispensable to those who use it in the ratio of its injury to their constitutions.

"Tobacco is a native of this country, and was first imported into Europe about the middle of the sixteenth century by Hernandez de Toledo, who sent it into Spain and Portugal. The Embassador of Francis II. at the court of Lisbon, carried it into France in 1560, when it was presented to Catharine de Medicis, as a plant of extraordinary virtues from the New World. The Embassador's name was Nicot, hence the botanical appellation *Nicotiana* applied to this genus of plants. The introduction of the custom of smoking it in England has been ascribed to Sir Walter Raleigh.

"We are told that some tribes of the aboriginal inhabitants of this continent used tobacco as a burnt offering, the smoke of which they supposed to be acceptable to the gods. Thus we find that different nations address themselves to different senses as the medium for obtaining divine conciliation. While the pious Christian seeks propitiation by vocal or instrumental music, or a concert of both, the poor untutored savage implores favor and happiness through the incense of aromatic gums and the odor of sweet-scented tobacco.

"It is remarkable, says a learned author, that in the days of its first general introduction into Europe no man spoke about it with coolness or indifference, but every one warmly espoused its censure or its praise. Camden, in his Life of Queen Elizabeth, says that 'men used tobacco everywhere, some for wantonness and some for health's sake, and that with insatiable desire and greediness, they sucked the stinking smoke thereof through an earthen pipe, which they pres-

ently blew out again at their nostrils—so that Englishmen's bodies were so delighted with this plant that they seemed as it were degenerated into barbarians.'"

At that rate, what a number of *in*side barbarians we must have here in New-York, where, according to the great statistical writer McGregor, ten thousand dollars' worth of cigars are smoked every day! to say nothing of the quantity that goes into the mouth and nose!

Dr. Venner, in a work entitled *Via Recta ad Vitam Longam*, published in London in 1638, gives a brief summary of the injuries done by tobacco: "It drieth the brain, dimmeth the sight, vitiateth the smell, hurteth the stomach, destroyeth the concoction, disturbeth the humors and spirits, corrupteth the breath, induceth a trembling of the limbs, exsiccateth the windpipe, lungs and liver, annoyeth the milt, scorcheth the heart, and causeth the blood to be adusted. In a word, it overthroweth the spirits, perverteth the understanding, and confoundeth the senses, with sudden astonishment and stupiditie of the whole body."

Thus, more than 200 years ago, was denounced the great staple which our Prince George's friends persist in cultivating. If half the learned Doctor says of it were true, one might suppose that Malthus himself could desire no more effectual check on the readiness of mankind to follow that one most heeded of all God's commandments. But, like old Count Cornaro's *Via Recta ad Vitam Longam*, we apprehend it will ever be found much easier *to read than to follow it*.

The priests of some tribes swallowed the smoke of tobacco to excite in them a spirit of divination, and when recovered from the fit of stupor into which it threw them, they asserted they had held a conference with the devil, and from him had learned to predict events. Their "Medicine Men" pretended to be inspired in like manner with a knowledge of diseases and their cure. The rich indulged in it, we are told, as a luxury of the highest order, and the poor, as now, gave themselves up to it as a solace for the miseries of life. In the Southern States, now, in their almost universal solicitude for the comfort of their slaves, planters provide for them a regular supply of tobacco.

So excessive became the use of it that in many countries its consumption was forbidden or restrained by public authority. So excited against it was the First James, of England, that he not only denounced it in his book, "The Tobacco Blast," but expressly prohibited the planters of Virginia from cultivating more than 100 pounds on any one plantation, and vehemently warned his subjects not to "sin against God and harm their own persons and goods, and render themselves scorned and contemned by strangers who should come among them, by persevering in a custom loathsome to the eye, hateful to the nose, and baneful to the brain." Of such sumptuary laws and arbitrary interference with private habits and individual economy and freedom of action, have we not even yet some unavailing if not barbarous relics on our statute books? In this, be it understood, we by no means refer to the municipal law, still in force in a neighboring city, against any man caught, *flagrante delicto, smoking in the street*—extending their magisterial benedictions against this pride of Maryland industry even farther than Pope Urban the VIIIth, who confined his excommunication to those only who should impiously diffuse the smoke of tobacco *in the churches!* In Constantinople the anti-tobacco laws were yet more severe, for there the Turk who was found smoking was paraded publicly, with the pipe *transfixed through his nose*—a more appropriate punishment, one would think, for such as belong to the numerous and fashionable tribe of *snuffers*.

In the earliest record of Harvard University, as is set forth in the Memoir before us, there is a regulation that "No scholar shall take tobacco unless permitted by the President, with the consent of their parents and guardians, and on good

reason first given by a physician, and then in a sober and private manner." We can't undertake to say how it is at Harvard University now, under the Presidency of a gentleman so distinguished for scholarship and courtly manners, but we apprehend, for that matter, that in many of our institutions, the justification of the student might be found in the example both of the LL. D.'s and the M. D.'s among their elders.

On the other hand, this exciting weed has not failed in advocates among the literati, some of whom have hymned its praises in various forms and languages; for as Mr. Jefferson extolled the *oil of olives* as "the next best gift of God to man *after bread*," the pious author of a Latin "Hymn to Tobacco," styles it "the gift of Heaven and the ornament of the earth." Hence is here submitted a picture of this ornament of the earth, to the judgment of the reader, who in making it up will please remember to *drop the worm!* By-the-by, it ought to be explained that his wormship is never caught, as here exposed, reposing on the *top* leaf; but there was not room to display an entire plant, and to place the beautiful object where he delights to "revel," that is, on the most delicate and richest parts of the prime leaves below, eschewing the coarsest and greenest portions of the leaf and stems, while his fell destroyer, Man, (not the turkey,) with less delicacy of discrimination, eschews none, but *chews* all the manufacturer gives him, with some not very nice additions, such as copperas, &c.

The narcotic properties of tobacco, to which it owes its fascinating powers, remind us not only of the "Confessions of the Opium-Eater," but of the effect also of the "*betel-root*," and another substance called "*churrus*," of the East Indies, where both are freely used, both as medicines and as opiates, having the power to beguile the imagination with the most delightful reveries. The similarity in the medical properties with those of tobacco, even suggest, if our planting friends will excuse the intimation, whether these Asiatic drugs may not at some future day, as yet it is to be hoped deeply wrapped in the womb of Time, be made to take the place of our great staple. Would it not, in a word, be more lamentable than strange, were the starveling natives of the East (called free) to supply, in the process of time, substitutes for two of the great products of the planting States, one entirely and the other in a great measure the product of Slave Labor—a labor with us so much better provided and more kindly cared for than any laboring class in Europe?

The *churrus*, above alluded to, is an *extract from hemp*, the *Cannabis Indica*. If what is said of the betel-nut be true, it ought certainly to be introduced into the veterinary practice of our country, than which practice nothing, no art, certainly, can well be in a lower or more rude and unsatisfactory state.

We might here introduce, were it only for the reason last stated, a more extended notice to illustrate their similarity, in effects, to the narcotic of which we are treating, but that it would swell this article to an immoderate length, and so we shall assign it, if we can, another and contiguous position—contenting ourselves here with this reference to it as a matter that may repay the attention of the curious reader. But again to the subject in hand.

It will be time enough hereafter to speak of all that concerns the cultivation and management of tobacco, except as to the preparation of the *seed and seed beds*. On these points we turn with interesting recollections to the time and the relations of intimate friendship which enabled us to draw, twenty-seven years ago, from one whose retiring disposition was only surpassed by his merit and capacity, "NOTES ON THE CULTIVATION AND MANAGEMENT OF TOBACCO, FROM THE

PLANT-BED TO THE PRIZE"--by PETER MINOR, of Albemarle County, Virginia. On these notes we shall chiefly depend for all that we shall have need to say farther of this plant, through all the stages of its growth, until it passes from the hands of the planter to be taxed in all countries. In that land of "free trade" where the great Agitator in its favor has been presented with a million of dollars, it pays *only* about 700 per cent. before it is allowed to reach the consumer.*

There is one thing which we do not see adverted to, that we apprehend needs particular attention, and that is, the particular *depth* at which these and all other seeds should be deposited—the smaller the shallower. The principle has been laid down, that full air, a moderate degree of moisture, and a temperature suited to the kind of seed, are all necessary to a perfect germination. We apprehend that the seed of tobacco cannot well be put in too shallow, as it is termed, provided the light be excluded. It has been observed, says Professor Johnston, that seeds cannot germinate if entirely excluded from the air. They will remain some of them apparently for ages without exhibiting any signs of life, and yet, when brought near the surface, will speedily begin to sprout. Thus it is that one may notice, all along the line of the New-York canals and railroads, myriads of the Canada thistle and other weeds, not present at first in cultivated fields.

CHOICE OF LAND FOR THE PLANT-BEDS, AND MODE OF PREPARING IT.—A rich virgin loam with a slight mixture of sand is ascertained to be the best soil for raising tobacco plants. Such spots are indicated by the growth of alder and hazel bushes in bottoms and on the margin of small streams, and if the situation has the command of water for irrigation it is on that account to be preferred. The spot being selected, the first operation is to burn it with a strong fire. For this purpose the growth of every kind is cut off, (not grubbed up) and the whole surface raked very clean. The burning should be done before Christmas, or as soon after as the weather will permit; and if done thus early it cannot be well too heavy, even bringing the soil to a hard cake. The wonderful fertility imparted to soil by fire, has of late years been clearly proved and developed by various experiments in this and other countries, but judging from long-established practice, we suppose it is a fact that has been long known to tobacco planters, that this fertility is imparted by the fire, and no ways dependent upon the ashes left by the process is clearly proved from the fact, that the same results will ensue if the ashes are swept off entirely clean. Or take another piece of ground of equal quality, cover it with as much or more ashes, and prepare it in every respect similar, except burning, and plants cannot be raised in it. Hence the necessity and propriety of regular and uniform burning, the want of which is always manifested by a diminutive, yellow and sickly growth of plants in those spots, not sufficiently acted on by the fire.

After the ground becomes cool from burning, the whole surface should be swept with a coarse twig broom to take out the coals. In this operation some of the ashes will be

* TOBACCO AND RICE.—The Washington Union has the following. "The following extract from a letter recently received in this city, from an intelligent American now traveling in Europe, contains information of importance to those of our countrymen engaged in growing rice and tobacco—especially at a season when these articles are in a state of preparation for shipment. We accordingly give it a conspicuous place in our columns, with a view of benefiting the interests of all those concerned:"

"SCHWERIN, Germany, Oct. 20, 1847.

* * * * "I should acquaint you with the existing tare established by the German Customs Union upon tobacco imported in hogsheads, and rice in tierces, as I ascertained it to be upon the frontier of the Duchy of Brunswick, when journeying to this place a few days ago.

"The tare on a hogshead of tobacco is 12 per cent. If the hogshead should weigh over 12 per cent. for the quantity of tobacco contained in it, the additional weight pays duty at the rate of 5½ Prussian thalers per zoll centner—equal to about $3 33 per 100 lbs. Hogsheads which contain 1,000 lbs. tobacco weigh in the aggregate, I have been told—some more and some much less—200 lbs.; consequently 80 lbs. of wood, or hogshead, pays tobacco duty, amounting to $2 68 4⁰.100 cents.

"This extra tax upon their staple product the planters may avoid by making their hogsheads uniformly of the same size—not to exceed in weight, if they are to hold 1,000 lbs. of tobacco, 120 lbs. This, if the wood be good, would insure sufficient strength.

"The Zoll-Vercin imported during the year 1846, 29,000 hogsheads of tobacco and stems. If, therefore, a duty of 20 per cent. instead of 12 was realized, for tare, our staple was taxed unnecessarily $77,731 75.

"The tare allowed on rice, in tierces, entering the States of the Zoll-Vercin, is 13 per cent.. It is to the interest of the producers of rice in the United States to be careful that there should be no excess of tare beyond this, inasmuch as they have a formidable competitor in Holland in the German markets. The Java rice is all imported in bags, upon which a tare of 4 per cent. is allowed in the Zoll-Verein. This the Dutch, with their habitual good economy, avoid exceeding." [Baltimore American.

removed, but that is of no consequence; it should then be broken up about two inches deep with grubbing-hoes, in which operation and in repeated choppings afterward with hilling-hoes, all roots will be cut and finally got out with a fine iron-tooth rake which will leave the ground in proper order to receive the seed.

The most approved time for sowing is about the first of February, the beds previously prepared being suffered to lie and mellow by the frost and snows to that time. But it will do very well to burn and sow after that time, as late as the first of March, taking care not to have the heat so great. The quantity of seed is as much as can be taken up in a common table-spoon* for 100 square yards, and that in proportion. This quantity of seed should be mixed with about one gallon of clean ashes, and half that quantity of plaster of Paris, and the whole well incorporated, and then strewed uniformly over the bed at two operations, crossing at right angles to insure regularity. Cabbage-seed for early planting, tomato, celery and lettuce-seed may be sowed in small quantities with the tobacco-seed, without material injury to the growth of the plants. After sowing the seed the ground is immediately trodden over closely with the feet, and covered thick with naked brush. If the frost is severe from this time it is common to take off the brush some time in the month of March, before the plants appear, and tread the bed again, and at the same time give the ground a slight dressing of manure. The dung of fowls of all sorts is sought after for this purpose, which being beaten, is sifted over the bed through a coarse basket or riddle. The brush is then restored, and not finally removed until the leaves of the plants are half an inch in diameter; when the dressing of manure is again applied, taking care to wait the approach of rain for that purpose. Any grass or weeds that may have sprung up in the mean time are carefully picked out In dry seasons, if the situation admits of it, the bed must be irrigated by training a small stream of water around the edge of it. If not, it should be watered every evening with a common watering-pot or pine bushes dipped in water and shaken over the bed until sufficient moisture is obtained.

Under a careful observance of this management, the plants, according as the seasons have been favorable or not, will be fit to transplant from the 15th of May to the 10th of June. A planter thinks himself lucky if he can get his crop pitched by the 10th of June. After that the seasons are uncertain from the heat of the weather, and the chances of success for a crop precarious—though it has been known to succeed when planted the middle of July.

It may be unnecessary to warn the reader to bear in mind the latitude in which the above was written, and the difference that makes in the time of sowing. Turning back two years for information, the best we could get on the same subject in Maryland, the time for sowing is stated to be about the first of March, but much, doubtless, depends on the nature of the weather and the state of the ground.

We should stop here for the present, were it not that the preparations of the planter for an early and full supply of plants is the turning-point in his operations for the year; for although in cases of failure with early sown beds, others might come on in time, the great danger is that then he might not have seasons. It is in nice, judicious and timely attention to this matter that such men as Mr. Talbert, and Zadock Sasseer, and Tilghman Crawford get their crops "pitched," while many of their easy-going neighbors are not half done. For a planter to be caught, when the season arrives, without plants, is as if the gallant, and yet more, the humane Gen. Scott had been unprovided with ammunition at the gates of Mexico. By way of relief, then, to the reader, tired, it may be, of the subject for the nonce, we will break off here, and give him, hereafter, a small chapter on the Germination of Seeds in general, which may be useful to all cultivators, whether gardeners or farmers. In a subsequent number we will tell all about planting, curing, seasoning, prizing, &c., and give analyses of the plant, as far as they have been made by *Vauquelin*, the celebrated French chemist, and others. It will be seen that the plant contains a large portion of lime.

* This quantity of plant-bed is generally considered under good circumstances as sufficient to set ten thousand hills in good time—but the prudent planter taking into consideration the casualties of fly, drouth, &c., will do well to make a larger allowance. We know of no certain remedy or antidote against the fly which destroys the early plants.

AYRSHIRE CATTLE.

OBSERVATIONS MADE IN EUROPE BY MR. COLMAN AND PROFESSOR NORTON—QUALITIES AND USES MADE OF THOSE IMPORTED IN MASSACHUSETTS—LETTER FROM MR. PHINNEY.

Readers attracted by personal interest in this breed, or by partiality for the general subject of cattle, may remember that in the September number of 1846 we published a description of the stock then recently imported by the Massachusetts Society for Promoting Agriculture, by E. Phinney, Esq., a Trustee of the Society. Referring now to that number, we have the pleasure to add the following obliging letter from Mr. P. in answer to inquiries as to the results of that and previous importations. Our readers will feel indebted to him, as we do, for the fullness and promptness of his reply.

J. S. Skinner, Esq. East Cambridge C. H., Nov. 29, 1847.

Dear Sir: Your favor of the 11th inst. making some inquiries as to the first and second importations of stock by the Massachusetts Society for Promoting Agriculture, was received on the 26th.

The first importation of stock by the Massachusetts Society, consisting of three cows and a bull of the Ayrshire breed, was made in 1837. They were selected at the request of the Society, by Mr. Hodgkinson, who was considered an excellent judge of stock. The cows were all in calf when they arrived, by first-rate bulls in Scotland. The bull was sent into the western counties of the Commonwealth, where he now is, or whether living or dead the Society know not. One of the cows was placed in the care of Hon. P. C. Brooks at his farm in Medford. The second was put into the hands of Hon. Daniel Webster, and placed on his farm at Marshfield. The third was put under the care of the subscriber, at his farm in Lexington. I have lately examined the stock of Mr. Webster. He has some very beautiful half and three-quarter and full blood cows and heifers, the descendants of the cow imported by the Society, and other Ayrshire stock, imported by him. The cow placed under his care by the Society proved a great milker; and not only Mr. Webster's stock, but that of his neighbors, are much improved by crosses with the Ayrshire breed. The cow committed to my care, now 18 years old, has been an excellent dairy cow, being a deep milker, and yielding in the winter, when kept on hay alone, some months after calving, ten pounds of butter per week. I have sold five of her descendants at $100 each, at a year old, and if I had had three times that number could have sold them at that price. By crosses of the Ayrshire with my best native cows, I have greatly improved the dairy properties of my stock, and also that of my neighbors.

From what I have seen and known of this and other imported breeds of cows, I am fully satisfied that as a dairy stock for New-England, there is no breed in this or any other country so valuable as the Ayrshire. They are quite as hardy, and endure our cold winters as well as our native stock. They are of medium size, with enormous milk-vessels, and, withal, a capacity for converting their food to milk much beyond any breed that I have known.

This breed of cows is now owned by many persons in this State. Mr. Cushing imported a number of Ayrshire cows and a bull about the time the Massachusetts Society made their first importation. Capt. Randall, of New-Bedford, some years ago, imported two or three first-rate Ayrshire cows, being of the "Swinley" breed, which is held in Scotland to be an improved breed of the Ayrshire. The Massachusetts Society, about a year since, purchased of Mr. Randall his Ayrshire cow, "Young Swinley," whose dam, Swinley, took more prizes than any cow in Scotland. Mr. Wright, of Lowell, has a fine Ayrshire cow, a descendant of Swinley. A Mr. Lawson, of Dracutt, has some excellent Ayrshire cows, and Mr. Morland, of Andover, has some imported cows of this breed. Hon. John C. Gray, President of the Massachusetts Society, has also a first-rate cow of the Ayrshire breed. These are all the persons I can now recollect who have the Ayrshire stock. There are, no doubt, many others. Great care has been taken by all who own this stock to keep the blood perfectly pure and unmixed with other breeds.

The offspring of the last importation, being four cows and a bull of the Ayrshire breed, and four cows and a bull of the North Devon breed, the Massachusetts Society for Promoting Agriculture have recently voted to distribute among the several County Agricultural Socie-

ties, free of charge. They are now making the distribution of all that are of sufficient age to be put to service. In this way the Society hope to enable all the farmers in the Commonwealth to improve their stock.

I regret that my engagements will not allow me to devote more time to this subject. You may, probably, however, find enough in this and my Report for your purpose.

With great respect, your ob't serv't, E. PHINNEY.

We had lost recollection of the importation by Mr. Cushing, referred to by Mr. P., but turning back now to the annals of that period, we find that he supplied Mr. Colman with an exact account of the produce of the four Ayrshire cows on his farm, as set forth in the following statement:

1. *Memoranda of Milk given by imported Ayrshire Cow Flora, for one year*, 1837.

From 17th of May to 1st of June	608 lbs.
" 1st of June to 1st of July	1192 "
" 1st of July to 1st of August	1064 "
" 1st of August to 1st of Sept	841 "
" 1st of September to 1st of Oct	718 "
" 1st of October to 1st of Nov	489 "
" 1st of November to 1st of Dec	409 "
" 1st of December to 1st of Jan	432 "
" 1st of January to 1st of Feb	442 "
" 1st of February to 1st of March	388 "
" 1st of March to 1st of April	484 "
" 1st of April to 1st of May	419 "
" 1st to 20th of May	242 "
Total	7728 lbs.

At 10 lbs. per gallon, 772 gallons.

2. *Memoranda of Milk given by imported Ayrshire Cow Juno, for one year*, 1837.

From 23d of May to 1st of June	243 lbs.
" 1st of June to 1st of July	796 "
" 1st of July to 1st of August	845 "
" 1st of August to 1st of Sept	600 "
" 1st of September to 1st of Oct	475 "
" 1st of October to 1st of Nov	313 "
" 1st of November to 1st of Dec	340 "
" 1st of December to 1st of Jan	394 "
" 1st of January to 1st of Feb	401 "
" 1st of February to 1st of March	326 "
" 1st of March to 1st of April	328 "
" 1st of April to 1st of May	216 "
" 1st to 7th of May	30 "
Total	5307 lbs.

At 10 lbs. per gallon, 530 gallons.

3. *Memoranda of Milk given by imported Ayrshire Cow Venus, from June 20 to May 21.*

From 20th June to 1st July	283 lbs.
" 1st July to 1st August	805 "
From 1st August to 1st September	693 lbs.
" 1st September to 1st October	567 "
" 1st October to 1st November	498 "
" 1st November to 1st December	319 "
" 1st December to 1st January	403 "
" 1st January to 1st February	406 "
" 1st February to 1st March	351 "
" 1st March to 1st April	368 "
" 1st April to 1st May	319 "
" 1st to 21st May	151 "
Total	5163 lbs.

At 10 lbs. per gallon, 516 gallons.

4. *Memoranda of Milk given by imported Ayrshire Cow Cora, from Nov. 17 to May 21.*

From 17th November to 1st December	388 lbs.
" 1st December to 1st January	834 "
" 1st January to 1st February	846 "
" 1st February to 1st March	776 "
" 1st March to 1st April	704 "
" 1st April to 1st May	670 "
" 1st to 21st May	405 "
Total	4623 lbs.

At 10 lbs. per gallon, 462 gallons.

The mode in which these cows are fed is as follows: "Our Ayrshire cows, during the winter, have half a bushel of sugar-beets or potatoes; with the former, about a pint of rye-meal mixed with the cut beets; but when they have potatoes, the meal is omitted.—With the above, they have as much English hay as they can eat. In the summer they have nothing but what they get in the pasture. They are driven, morning and night, from the pasture to the barn to be milked, and after that operation are driven again to the pasture."

To the above statement Mr. Colman adds (as we find in the New Genesee Farmer) the following from Mr. Randall, of New-Bedford, Massachusetts, dated September 9, 1841:

"My thorough-bred, full-blooded Ayrshire cow Swinley, was imported by me from Scotland in 1839. She was six years old in May last. She calved on the 31st of last March. She was milked regularly three days previous to dropping her calf, and had drawn from her in the time from 45 to 50 quarts. Commenced setting her milk for butter on the 1st day of April. The calf was not allowed to touch a teat, was fed on new milk for nine days, and after that time on skimmed milk. In all April, the quantity made from her was 43 lbs. 6 oz. The quantity in May was 42 lbs. 4 oz. In this month her milk decreased. Quantity in June was 44 lbs. 7 oz. In July and August, her milk was not kept separate from that of other cows. Weighed her milk (for one day) on the 7th of April; it weighed 43 lbs. 9 oz. On the 2d of September commenced weighing her milk; in four days it has averaged 25 lbs. 3 oz., and has made in four days just 5 lbs. of butter. My pasture through the season has been very poor and short, owing to the dry weather and having too much stock for the quantity of pasture. From the time this cow was turned to grass until this day, (9th September,) she has had by measure two quarts of Indian meal per day regularly."

To the above we may here add what Mr. Colman has more recently said of Ayrshire and North Devon cattle, (the two breeds imported by the Massachusetts Society,) being the result of inquiries and observation on the spot:

"The statement of a farmer in Stirlingshire, of the highest eminence, given to me, was that his Ayrshire cows, in the best of the season, averaged one pound of butter per day; that he has known two Ayrshire cows to make two pounds two ounces each per day; and that with him sixteen quarts of milk produced one pound of butter.

"The North Devon stock have some strong advocates as a milking stock. The most productive cow in butter which I have found was a North Devon, which, for several weeks in succession, without extra feed, produced twenty-one pounds of butter per week. The character of the owner places the fact beyond a doubt. Mr. Bloomfield, the eminent tenant of Lord Leicester, after many years' experience, states that his North Devon cows will give an average of four pounds of butter per week through the year. One English pint of milk, as he adds, will produce one ounce of butter; that is, eight quarts will make a pound."*

We must conclude what we have to say for the present about Ayrshires, with the following (which we find in the American Agriculturist) from Mr. Norton, Professor of Chemistry as applied to Agriculture, at Yale College. It is dated Edinburgh, 25th October, 1844:

"I found the Ayrshires generally the only breed in that part of Scotland; of course there are mixtures and crosses, but they very greatly prevail. The largest number of cows upon any of the farms which I saw was at Mr. John Tennant's, 6 miles from Ayr. He had about 90; some 30 of them, however, were fattening. Mr. Alexander, of Southbarr, has a fine dairy of about 40, at Wellwood, near Muirkirk. Mr. Fleming's, of Barrochan, is also worthy of notice. I was particularly pleased with that of Mr. Burnett, of Gadgirth, where every particular as to each churning is entered in a book kept for the purpose, so that a glance tells the quantity of cream or milk used, the weight of butter obtained, the time occupied in churning, and the temperature.

"Weight of the Ayrshires.—On this point I could only obtain an approximation to a general rule. The average weight of Mr. Tennant's cows, as he informed me, is from 36 to 43 stones (about 500 to 600 lbs.) dead weight.—I found that the animals raised expressly for fattening, are almost invariably a cross with the Short-Horns. Every large farm that I visited, had a full-blood Short-Horn bull. *The improvement in shape and size from this cross is very great. They also mature much earlier.* Mr. Tennant turns his off at two years old past, and says that they then weigh from 50 to 60 stones, or from 700 to 850 lbs. Two very important points are thus attained—increase of size, with a gain of from 6 to 12 months in the time of maturing for market. On some farms the Angus or Polled breed seemed to be favorites for fattening; and on others the small West Highlanders are bought in the autumn, and sold in the succeeding autumn, after a year's keeping on the rich lowland pastures.

"Milking Qualities.—The Ayrshires, as you are probably aware, stand very high in this respect. Though they are small in size, their milk is abundant in quantity and remarkable for richness. Mr. Tennant stated that in the hight of the season his cows yielded about 10 Scotch pints, or 30 English, per day, and that they averaged not far from 170 lbs. of butter per annum. Mr. Fleming, however, told me that on the best lowland pasture, a good cow yields 2,000 Scotch pints, 8 of which are considered equal to a pound of butter. This would be 240 lbs. per annum; on poorer or high land he would not expect more than 150 pints, or 180 lbs. butter, which would nearly agree with Mr. Tennant's statement. The Scotch pint is 3 English pints—350 to 400 lbs. of whole milk cheese is mentioned as a fair average."

Finally, on this as on other matters treated in this journal, we may safely say with Mr. Colman: "My business is with facts, and having no prejudices of

* It is through Mr. Bloomfield that Mr. Patterson, of Springfield, Md., obtains a fresh Devon bull every two or three years. In reference to his last, which we recently saw in a field with twenty-six magnificent Devon cows and heifers, he was good enough at our request to give us the following extract from J. Bloomfield, Jr., dated 30th June, 1846:

"With respect to the bull, I consider myself very fortunate in being able to offer you an animal which will do us, as breeders, much credit. He is out of one of our best cows, by the bull I bought in Devonshire, and which is, I believe, a near relation to to the bull which obtained the first prize of 20 sovereigns and the gold medal, at the Royal Agricultural Show last year—Mr. James Quartly, of Molland in Devonshire, being the breeder of both that and my bull's sire. A Mr. Bickell, from your county, sent out by the Massachusetts Agricultural Society to select cattle, saw him last summer, but he was unfortunately lame and could not go. Mr. B. took a four-months-old bull calf instead."

It is deemed useful to preserve such extracts as items of *cattle history*.

which I am conscious to warp my own views, I shall, as fairly as I can, state those facts which have come generally within my own observation, and leave the conclusions to the honest judgment of my readers." Far from presuming that we alone are privileged to know everything, and no one else anything, we are always but too glad to pick up information wherever we can find it, and every little we get only aggravates the desire for more.

THE ENGLISH STANDARD OF FLOUR,

TO BE HAD FROM A QUARTER (EIGHT BUSHELS) OF WHEAT.

To the Editor of The Farmers' Library:

Dear Sir—I want it recorded, and I have taken the liberty of sending to you the following result of a quarter of wheat, ground at an English mill, which is a standard in England for all master millers or persons taking charge of the mill. If he cannot effect such a proportionate yield, he is at once discharged by his employer; and I hope it will be thought of sufficient importance to find a place in The Farmers' Library. It was given to me by a very intelligent gentleman owning a large mill in this country, and who has visited England.

8 bushels of wheat, weight 61½ lbs. per bushel	lbs. 492
yield—6½ bushels flour, 56 lbs. per bushel	lbs. 364
Inferior flour	28
Fine middlings	11
Coarse middlings	17
Pollards (supposed to be fine ship-stuff)	26
Bran	42
Waste	4
	lbs. 492

I am truly yours, JOHN TRAVERS.

The above Table gives what we call *practical information*, such as, editorially, we have all our lives aimed at. We consider such an item a far better lesson to be taught in our Common Schools, than one-half of the lessons in the history of bygone and barbarous times. What is the usual yield in American mills? We guess the Yankee miller can grind about as close as another man!

What farmer can tell what weight of food, green or dry, is to be extracted from land that will yield a given quantity of Indian corn? Have our Institutes or Societies prompted investigations of this character? Will any one make us a list of the premiums that have been given the past season for eliciting *new and important information in Agriculture?* [*Ed. Farm. Lib.*

CROSSING BREEDS.

We apprehend there is too much readiness to believe that better breeds of cattle than we now have may be made and maintained by crossing one distinct breed on another.

This we have always deemed an error. Of the existing breeds, one is better than another under all circumstances, according to locality, food, the purposes for which it is designed, &c.; but it would be vain to attempt to form a new breed out of them, for, be the object what it may—the yoke, the dairy, the shambles, or what not—breeds have already been formed out of the best of other breeds, or natural races have been cherished and improved with reference to all these objects. Better then will it be, and a great saving of time, to hold on to

the breeds in existence, and endeavor to improve them, than to enter upon the formation of new ones by crossing one breed on another, in the hope of preserving out of each exactly what we want, and throwing off what don't suit us.—Doubtless we may take a bull of improved blood, and, by crossing, breed up a stock improved on the basis of the common cattle—that is, if we have recourse to the improved blood often enough to avoid breeding in-and-in.

But the whole system must be laid down with care, and followed with judgment, to prevent ultimate degeneracy. One reason why the progeny of so many imported bulls have deteriorated is that there has been too much close breeding—too much breeding in-and-in. Those who undertake to raise thorough bred must continue every two or three years to import a bull, as Mr. Patterson does—the best to be had, without respect to price—or they should obtain a bull from other stock in our own country, if to be had, as good as the best to be had abroad. This is the course, no doubt, that the Massachusetts Agricultural Society will adopt, or in a few years degeneracy will mark the descendants of their imported stock.

In England, sheep farmers, the best, don't pretend to rear their own rams.—They find it more to their advantage to hire choice rams from noted breeders who make a business of rearing the very best for that purpose. We are yet a great way from beginning to approach the high standard in skill and success in breeding domestic animals. Short cuts and short apprenticeships may do in other things, but not in this.

COAL TAR:

TO WHAT USES APPLICABLE.

JOHN S. SKINNER, Esq. NEW-ORLEANS, April 6, 1846.

Dear Sir: In answer to your request that I would make a statement to you of my experience of the uses to which coal tar can be applied, I beg leave to transmit you the following: Coal tar is a great preserver of timber. I have seen fence posts and pickets drawn from their places in which they had been driven ten years before, as sound as when first cut. They had been well saturated with coal tar. Coal tar mixed with sharp sand and a little lime, say a pint to a gallon, well stirred over a slow fire until it simmers, has been used with great effect upon shingle and other wooden roofs, and upon fence-rails. Two or three coats ought to be laid on, and when used it should be hot. Use a whitewash brush, and let each coat dry before applying the next. All iron-work painted with it is permanently preserved from rust. Any coloring matter may be thrown in while preparing it, to suit the taste.

I consider it a very valuable article on farms and plantations; and what ought to recommend it particularly to farmers is its cheapness, its price not exceeding $3 per barrel of 32 gallons. There are many other uses, no doubt, to which it might be applied besides those I have named. Hoping those pointed out may draw the attention of your readers,

I am, with great respect, your ob't serv't JAMES H. CARDWELL.

IMPROVED CANDLE-WICKS.—An improved candle may be made by steeping cotton wicks in lime-water, in which a considerable quantity of saltpetre (nitre) has been dissolved. By this means is obtained a pure flame and a superior light; a more perfect combustion is insured; snuffing is rendered nearly as superfluous as in wax-lights; and the candles thus made do not run or waste. The wicks should be thoroughly dry before they are covered with tallow, otherwise they will not burn with a uniform and clear light.

APOLOGY OF THE PRAIRIES AS WOOL PRODUCERS.

JOHN S. SKINNER, Esq.: OTTAWA, Illinois, Nov. 12, 1847.

Sir: Accidentally have fallen under my observation the Letters, published in your journal, from Mr. H. S. Randall, in which, with great appearance of candor, he has undertaken to consider the relative advantages of the various sections of the world as wool producers, and incidentally to compare, in this respect, the prairie regions with the more southern States of this Union.

I should hardly have ventured to appear in your Journal, in defence of anything Western, did I not anticipate from the agricultural community a more favorable reception than is generally accorded to us in social circles at the East, in which it is by no means a rarity for the lady, (as was the case with one of them, recently cast among us,) who, though so ignorant of life's wants and duties as to be compelled to ask whether the milk or the cream is churned to produce the butter, and to call in a hand from the farm to decide for her when the kettle comes to the boil, yet hesitates not to declaim against us, as wanting in the comforts and knowledge of life, and lacking in refinement of manners. Moreover, with something of pride for the land I love before all others, is mixed a desire to warn, from the dangerous experiment of competing, at the South. with wool producers on the Prairies, persons who might be misled by the remarks and statements of Mr. Randall, in estimating the advantages against which they would have to contend. For nowhere have I met with more formidable statements of facts, in themselves partially or entirely true, which, when combined, produced so dangerous a falsity; one of the best instances to prove that however safe it may be to speculate, and, with partial advantage, upon the capacities and political relations and destinies of countries, basing one's calculations and estimates upon the statements of others, yet it is dangerous to venture a heavy stake upon the correctness of our conclusions—so fatal to our reasonings and, in practice, to our profits may be variations or advantages, so slight or so minute in themselves as to have escaped the observation either of narrator or of his auditor.

The editors of the Prairie Farmer, published at Chicago, have laconically met the assertion of the incapacity of the Prairies in this respect by the ancient argument, "We do it—doeth the South also?" and upon this proof are content to rest.

This reply, however conclusive it may be, is not such as the elaborate and well-defined statements of Mr. Randall are entitled to, neither, indeed, in my opinion, is it justice to the prairies themselves—since the question at issue is not whether they can produce wool, but whether they can produce it in competition with the Southern States, if the latter shall choose to enter the lists.

To my own idea, the first, most broad and notable objection to the chain of reasoning adopted by Mr. Randall, in his comparison of the wool producing powers of the prairies and the South, is the fact that he does not apply to the investigation of their capacities the same tests which he finds important in deciding the relative claims of European countries, and which, in some cases, cause him to reject them without farther investigation. Of these tests, the most prominent is that of peculiarity of civil institutions. If, as he asserts, the character of the political condition of Turkey and of Spain is sufficient, in the mind of Mr. Randall, to decide against their competing with Hungary in this branch of Agriculture, I can account for his silence upon the same argument against the Southern States of the Union, upon no other supposition than that of a previously formed opinion having shut it from his sight.

This point, to me, is the more remarkable, because it is generally understood that we have yet to discover the first article, either of production or of manufacture, which the climate or position of the Free States will tolerate, in which the Slave regions have been able to bring their "cheaper labor" successfully and extensively to bear against the great guns of superior sagacity, skill and economy. And here I would remark that he errs vastly in supposing that the South,

as heavier capitalists than the North, are content with lesser profits; (no people *require* greater returns from capital invested;) and he also errs, in his estimate of their relative capital, in his losing sight of that great element of capital existing at the North, the *personal exertions* of the inhabitants.

But in addition to this of *per capita* capital, which Mr. Randall applies to the entire North, there are other and most numerous difficulties under which he considers the Prairie regions to labor, and I shall proceed to investigate their validity, applying at the same time the test of personal experience.

The first of these which occur to me, are his mistaken notions of our soil and herbage, peculiar as they are to the prairies. From some unknown property of the former, nearly all of the weeds and plants of this region possess an acridity and pungency which I believe is elsewhere unknown, and although it may be true that some of these plants are preferred and soon exterminated by sheep, yet it must not be inferred that they like and thrive upon no other. The wild pea and wild bean, (to which alone I understand Mr. Wight's remarks to apply,) are found in every newly settled part of our Union, and in all cases meet the same fate as here. Of the *wild grasses*, we have, it is true, more than *one* variety; but there is one which vastly predominates over all the others, and is changed materially in its appearance by the soil from which it accidentally springs. Thus, upon the peaks of the dry and sandy rolling prairies, it is short, fine in its leaf, and sparse in its stools, while, upon the fat valleys, bordering the streams, it becomes tall, rank and comparatively compact. Of this grass, while young and tender, sheep and other stock are excessively fond, passing, untasted, the choicest of timothy and clover to seek it. To keep a supply of this grass young and tender, all provident farmers and wool-growers arrange that system of "late burns," which the wording upon page 78 indicates Mr. Randall not to understand. For although each of our Western States prohibits the firing of the prairies, in the winter, as dangerous, yet no one here considers it nearly so hazardous to fire the dead grass, intermixed with the green growth of the present year, as is that practice, so common among farmers, the firing of stubble. Wherefore you will perceive it is no new "suggestion," either of Mr. Flower, or of Mr. Wight, of doubtful expediency. I burn two thousand acres, at least, in this way, every year; and it is by means of this practice, in connection with continuous depasturing, that I seek to accomplish that great desideratum with us, which Mr. Randall evidently considers almost fatal to the claims of the prairies as pasture grounds;—I mean the extirpation of the wild grasses. So far from this being an objection, herein lies one of the profits of Sheep Husbandry, on these plains, for, not only are the lands enriched by the droppings of the stock, but so completely are the long roots exhausted and destroyed by continuous burning and depasturing, that that plowing which, on page 79, is made to require from four to six yoke of oxen, is easily done by one. But the advantage stops not here, for Mr. R. is decidedly in error in his note to the same page,* where he says that no practical farmer will credit the assertion that the seeds of the cultivated grasses will "catch" when sown "on the surface of the prairie sod," as may be satisfactorily demonstrated by an inspection of the extensive tame pastures, created in this manner, belonging to that most excellent practical farmer and grazier, Mr. Holderman, near this village. His pastures now cover fifteen hundred acres, nearly all under a single fence. The truth of this matter is, that so soon as the native grasses are destroyed, (which may be done, if properly followed up, in two or three years, or, if not, may require twenty,) the seed of the timothy, blue-grass or red-top being thickly sown, and afterward well harrowed or even well trodden in by a large stock of sheep or cattle, will soon mat the surface with as fine a crop of grass as our prairies will produce, and it is generally believed that, put in in this mode, the pastures are more durable.

Perhaps at this point I might be content to rest, satisfied in having corrected an error so material to his calculations as seriously to affect if not to settle the question of the advocated *superiority* of the South. But my hand being in, and not desiring the appearance of shrinking from objections, rained down in a storm

*It is worthy of passing remark that Mr. Randall should have been so readily willing to believe and publish what he considers an objection to prairie pasturing, (that they soon are eaten out,) while he slurs over in a mere note another important advantage arising out of it, and casts great doubt and discredit on the fact itself, to wit: That the seeds of the tame grasses, or some of them, will catch, and seed down the unbroken sods of the prairie, if rightly applied.

upon page 80, I shall touch lightly upon those which appear to me to be peculiar to the prairies, and ask if such others as I find there, to wit: the cost of improved and fenced farms; the danger of diseases spreading extensively among unherded and wandering flocks; the certainty of stray and disowned bucks causing "winter lambs," if allowed to run at large; and the like, are not as applicable to the sunny South as the rigid North. And here, passingly, I remark that foul weeds, burs, Spanish needles, hoarhound and the like are rather more likely to prosper in the fields, and destroy the value of the wool of a region cultivated by that "cheaper labor," than in a region like this. Any wool grower knows the care and attention required to keep down these in a fertile region, whether North or South. The objections on page 80, which are applicable to the prairies alone, are the scarcity of timber and difficulty of procuring coal, and consequent costliness of fencing-stuff and fuel; the thickness or compactness of the settlements already made on this side of the Mississippi, and consequent limited range; and the greater extremes of heat and cold.

The first two of these are deficient in fact, since even in the most favored locations timber will not command more than ten dollars per acre, and very rarely can five be got, while I can point to hundreds of thousands of acres of prairie land to be had for one to two dollars per acre, with timber adjacent at a similar price, and coal cropping out from bluffs of half the streams entering the Illinois, to be had for the quarrying, which is worth about two or three cents per bushel. But, even where timber costs ten dollars per acre, a fence, suitable for protecting sheep pastures efficiently, may be constructed for thirty-five cents per rod, and by fencing large fields, 640 acres, (which should always be done here,) the cost of fencing a sheep farm may be kept within fifty cents per acre.

The idea of mining by shafts in a prairie is most undoubtedly fallacious; but I do not perceive how Mr. Randall reconciles the two assertions of a scarcity of fuel to an extent to affect the wants of a shepherd herding; and of a farming community already existing in the same country and being so dense as to limit his range, or cause his flocks to be interfered with by those of his neighbors. Mr. Randall to the contrary notwithstanding, I beg to be permitted to assure you such is not the case, in that tolerably extensive region lying between the eastern boundary of Illinois and the western of Missouri, and extending as far south as the Ohio River, and as far north as the British Possessions. And where Mr. R. supposes a man and horse with a brace of dogs might herd one thousand sheep, and have a little spare time, I find a boy of twelve years can successfully herd two thousand head with a single dog and without the horse.

As to the extremes of heat and cold, I do not think the case is fairly proven, so far as sheep are concerned, since it is not so much the extremes as sudden changes of temperature that affect them; and it must be noticed that under any circumstances the Tables introduced on this point by Mr. R. do not prove anything whatever, since all of the observations quoted, which he intends should represent the temperature at the South, are taken on the seaboard, where the ocean equalizes the temperature, and not in the interior, as is the case with those. he intends should represent the temperature of the North. It is not on the seaboard of the South that he advocates the production of wool.

It is a matter of some surprise to me that Mr. R. should have admitted so freely as he appears to do the *present* healthfulness of sheep with us generally, and I do not perceive how he considers this to correspond with the opinion (expressed in Letter V., page 521) that the coarseness and rankness of our grasses unfit them for the growing of wool. He is evidently ignorant of the fact that the upland grasses here are far *finer* than the clover or the timothy, and that many of our most experienced wool-growers prefer the coarsest hay from the bottoms, as being not only cheaper, but heartier and better than any other. He need be under no apprehension on that score.

The scarcity of water and the length of the winters are undoubtedly valid objections so far as they go, and these I propose to consider in a future letter, but the remarks upon the mortality among sheep *driven* into this country, which Mr. R. says "is usually attributed to over-driving, poisoning, &c.," but is in reality caused by the temperature and climate, I consider another error. Had Mr. R. seen, as many here have, lumps of mud removed from the lungs of this class of sheep, and witnessed also the effects of poisonous plants taken into the

stomach, he would probably agree with the general opinion here. I have had under my charge, at the same time, healthy, well-driven stock from the county of Washington, Pennsylvania, and another over-driven from the county of Yates in your own State, and I am credibly assured by my shepherd and the butchers that they had no difficulty in distinguishing between the firm, plump flesh of the one, and the soft, flabby meat of the other. It is too well understood to be questioned now, and it may be regarded as an established fact, that the chief if not the only dangers to well attended flocks here, are the want of sufficient feed in fall, winter and spring, and careful driving in coming hither. The losses from these causes must not be laid to either climate or soil.

Your ob't serv't, BRONSON MURRAY.

Since our last number we have had the pleasure to make acquaintance with the writer, and the boy referred to who, with a Scotch colley dog for his assistant, has charge and takes care of 2,000 sheep. Their fleeces of the last season brought 36 cents a pound. The writer supposes it will take half his wool to pay all charges, but then he has the lambs "in the bargain." When they get overstocked the custom is to let the surplus out for so much, or such a portion of the wool. Muttons are killed and dried up for the sake of their tallow, except the hind-quarters, which are salted and sold for what they will bring—a cent or two a pound. Is not ours a wonderful country! [*Ed. Farm. Lib.*

EDUCATIONAL AND AGRICULTURAL COMMITTEES:

THEIR CHARACTER AND DUTIES.

It was only after agricultural journals came into existence, and the farmers began to imagine that *they* too had an interest to be cared for, that legislative Committees were appointed in many of the States and in Congress. We are under the impression that the widely beloved and benevolent General Solomon Van Rensselaer was the first chairman of an Agricultural Committee of the House of Representatives, and in some States no such Committees are appointed to this day. The custom is to appoint such a Committee, and to have their names *blazoned, along with others, to the public*, and thus the vanity of small men is flattered by seeing their names in the papers as *members of a Committee*, and there the thing usually ends.

Of the rights of Agriculture, and of what legislation could do for *it*, while it is protecting and providing for every parasitical interest that lives on it, these wise and public-spirited law-makers know but little, and, if possible, care less. Thus session passes after session, and these drones draw their pay and go home without any, the slightest attempt, to investigate the condition, to weigh the burdens, or to understand the wants of the very interest which they themselves often with abject and unbecoming importunity solicited authority to *represent*.

The same may in general be said of *Committees on Education*. Where are the Reports, such as ought to be expected, from gifted and honorable men intrusted with the high office of legislation? Where are their Reports on the two greatest of all human concerns, *Education and Agriculture?* If nothing can be *done*, can't something be said, in their behalf? Are the systems provided for and in operation in reference to either of these two great interests of society, so perfect that nothing remains to be suggested or enacted by those who are deputed to watch over the political and social interests of the Commonwealth?

Are these gentlemen themselves so familiar with all the sources and springs of public prosperity that no farther inquiry or development is needed to enable them to perform understandingly the business of government. Let any one of them go into a school in his own county, and there obtain a *list of all the books* and a programme of the course of instruction and publish it, (as we intend to do the first leisure we can get,) and let the world judge whether *such education* is calculated to instruct and prepare the sons of farmers to enter on the business of their lives with any *knowledge of the principles* which every step in their career requires that they should understand? Take one of these members of an Agricultural Committee through a plain catechism as to the agricultural resources and condition of his own county, whose interests are confined to his keeping, as far as they depend on public legislation, and see how small he will sing —how cheap he will look! Ask him what provision has ever been made, or whether he proposes to make any for an *agricultural survey* of the State, that authentic statistics of each county may be at hand, without which, who can understand the bearing of the laws upon it—its burdens or its wants? Ask him, and it is ten to one he can't answer. How many acres in the county? Has it beds of lime, or marl, or coal, or iron? How much in timber—in mountain—in meadow—or in arable land? How many domestic animals—how many laborers—the cost of transportation, and how to be lessened? What are its average products, and with what charges are they burdened in the operations of exchanges until their ultimate values are realized? Yet ought not careful agricultural surveys to be provided for, which should bring to light every hidden resource, and indicate every known production and the capacity of *every county?* Is there any act of any State Legislature, for instance, whereby the Chairman of an Agricultural Committee (dumb as a fish as some of them are) can tell, even as to a single county, as much as we know of foreign countries. For example, we know that according to the most recent computation, England and Wales contain 37,738,930 acres; Ireland 19,441,954; Scotland 19,738,930; and other British Islands 1,119,159—making a total of 77,394,443. And then we know by means of forecasting, provident legislation, that these acres are thus appropriated:

	England and Wales.	Scotland.	Ireland.	British Islands.
Cultivated acres..	28,749,000	5,265,000	12,152,286	383,690
Improvable waste	3,984,000	5,950,000	4,900,604	166,690
Unimprovable ...	4,361,400	8,523,938	2,416,664	569,469
Total.....	37,094,400	19,808,988	19,446,964	1,119,159

In England and Wales 3,250,000 acres of land are in wheat; 4,500,000 in barley, oats, rye, peas, &c.; 2,400,000 in grass and turnips; 2,100,000 in fallow; 17,500,000 in pasture; 18,000 in pleasure grounds; 1,200,000 in hedges, copses and woods; and 1,300,000 in roads, highways and watercourses.

Until these things are done for each State, and education expressly adapted to Agriculture provided for, how can members of Committees on these subjects reconcile it to themselves, as honest agents of the people, to lounge through a whole session, pocket their per diem, and go home without even an attempt to enlighten themselves or the public on the condition of these two great fundamental concerns of every State in this Union? What would they themselves say if on going back from the seat of Government to their homes, as many of them do reluctantly, like boys going back after a holiday to school, what would they say if they found that their overseers had in like manner neglected the matters committed to them; and yet you shall see the members of these Committees and the whole body of legislators, even adjourning from their proper business to

go, as at Annapolis, like "children of a larger growth," to *see cannon loaded and fired by the èlèves of the Naval School*—a school where the privileged few get education and life commissions, at the cost of *their constituents*—yet they have not the courage—they dare not even inquire, (for we have tried them in three States,) *what is the cost of these military schools*, thus supported by the landed interest, and whether that interest might not be allowed to make so bold as to *petition* for some provision also for instruction in the art of *production*, as well as of *destruction*. But we have no patience to dwell on dereliction so palpable, on such abject political cowardice. The day we hope will come when some man will have the discernment and the manliness to demand for agricultural education, as for education in the science of human destruction, *at least dollar for dollar*.

For the present we took our pen merely to exhibit one token of an awakening disposition to assert the wants and the rights of Agriculture, as we find the agreeable proof of it in the Report of Mr. Coad of St. Mary's County, Maryland, Chairman of the Committee on Agriculture, in the last House of Delegates of that State. Honorable as was this preliminary movement to his patriotism and character as a legislator and statesman, it will be seen how cautiously he felt himself obliged to approach the subject, as if he were going to demand some great boon for the State, for the benefit of those who constitute the State and all on which its prosperity depends. Probably he held in prudent, as he must have held in contemptuous recollection, a certain memorial once addressed from ——— County in Maryland against the wisdom and necessity of any authorized *geological data, or exploration* of any part of the State! Were we not restrained by shame for our native state, we would put the self-stultifying document on record with the names of its illustrious signers; but let it be forgotten, with congenial Blue Laws, and laws for burning witches and Quakers!!

The allusion at the close of the Report, of which we have taken only a part, is to Hon. Mr. Naill, the zealous and enlightened Chairman of the Agricultural Committee in the Senate of that State.

It is scarcely necessary to add, so much is that a *matter of course*, that this proposition, being for the benefit of *Agriculture*, *it evaporated in smoke!* None the less honor, however, is due to the zeal and intelligence of its author. Let zealous, conscientious, enlightened and industrious men be in all cases selected with careful consideration, for these Committees on *Agriculture and Education*, (not mere drones, or young lawyers who go to State Legislatures as stepping-stones to higher places,—walking on the shoulders of farmers and planters into power, as soldiers up scaling-ladders into a fort)—and we may hope at last that *constant dropping will wear away stones*. Heartily as we approve the measure proposed, as far as it goes, we must take leave to add that it falls very short of what the landed interest of the State, in our poor judgment, has a right to *demand*, (demand of whom? of themselves;) and if the people—the bone and sinew, the planters and farmers of Maryland, were of our mind—much as we approve of the Naval School, and heartily as with our pen, for years, we endeavored to *have one located there*, yet no Representative in Congress from Maryland should dare vote one penny for that, or any other Military School, until Congress had provided, out of the sales of the Public Lands or otherwise, a fund for the establishment of a *Normal School for training teachers in the Sciences connected with Agriculture*. Suppose, for example, Strawberry Hill, which overlooks Annapolis, were purchased and established as an agricultural training

school and experimental farm, where Science might be proved and justified by practice, would it not be as useful to the country as a Military School? and would not the Representatives of the country be as well employed in going out to see the trial of new implements, and the results of scientific analyses and experiments, as they are now when they adjourn to see *cannon fired at Fort Severn?* Alas, what can be expected for the interests we advocate, as long as agriculturists consent to have themselves regarded as a *subordinate class,* and continue themselves to look on the learned and the military professions as *embracing men of a superior order,* of whom a *mere plain countryman should stand in awe!* But, to our extract from Mr. Coad's Report in favor of appointing an

AGRICULTURAL CHEMIST FOR THE STATE.

It is not to be expected that this measure will at once and alone cause to be diffused among the agriculturists of the State, that full and extended knowledge which it is hoped will be ultimately imparted. The committee regard it as an initiatory step, by which, from its partial advantages, the farmers throughout the State will be induced to place a proper estimate upon the true merits of a more enlarged system. They hope by its agency to lead those now actively engaged in cultivating the soil, to place within the reach of those who are to succeed them, and for whose interest and happiness they are chiefly stimulated to industry and exertion, the means of tilling it with greater success. It is also believed that immediate benefits will accrue to themselves, more than sufficient to compensate them and the State, for the trivial expense necessary to be incurred.

It is deemed unnecessary here to explain in detail, the manner in which a scientific and practical chemist could render efficient aid to the agricultural interest. It is, however, well known that the people have never yet had an opportunity, had they desired it, of becoming either theoretically or practically acquainted with the interesting subject which it would be his duty to unfold. And the most casual observer of such subjects cannot have failed to remark that vast sources of improvement, either unused or misapplied, are utterly valueless to their owners and to the State, on account of a deficiency of knowledge on this subject. Principles equally well established, and far more certain in their application, should govern the planter and the farmer in improving his land, and cultivating his crops, as regulate the physician in treating the diseased system or invigorating the weak constitution of his patient. Each variety of soil has its peculiar defects, which ought to be supplied; each kind of crop its best mode of cultivation, which ought to be understood. These are constantly varying according to circumstances, but are always regulated by unchanging principles. To inculcate these principles, and to impart the requisite knowledge to insure their proper application, comprise the whole sphere of his duties.

A certain number of constituent ingredients must necessarily be combined to produce a given crop. These, if they cannot be supplied by the atmosphere, must be found in the soil. The farmer therefore, who wishes to produce such a crop, ought first to ascertain whether his land is deficient in any of the necessary constituents—for the absence of any one or more of them would defeat his expectations, and for that reason ought to be supplied. It may be that he has at his command different kinds of materials for improvement. Each of them may contain one, two or more of the component elements of the crop; but none of them all. If he select a kind which, although it may be rich in one or more of such components, yet, if it does not contain those in which his soil is deficient he will find his labor has been thrown away, his expectations disappointed, and all future efforts paralyzed or discouraged. A full knowledge of Agricultural Chemistry, and its practical application, would relieve a person so situated from all these difficulties and disappointments. He would then have known what combination of elements the product to be raised consisted of; which of them could be supplied by the atmosphere; and by analysis which of them would be furnished by the soil; and by that means, which, if any, he would be obliged to add. He could also ascertain the ingredients of each sort of material of improvement at his disposal; and hence be enabled to apply exactly the kind necessary to make up the deficiency.

Marl of the same kind has been found to act most beneficially on some soils, while on others it has either no decided effect or even a prejudicial one. On the same soil it has been found useful in the production of certain crops while others are injured by it. To the uninstructed in vegetable physiology and agricultural chemistry this is altogether unintelligible; while to one well informed on these most interesting subjects, it affords no mystery at all; it serves rather to open to his view the existence and harmonious operation of the immutable laws of Nature coeval and coexistent with Creation itself. He with almost unerring confidence might have foretold its effects; and been enabled to guard against its mischiefs and increase its usefulness. Place within the reach of the agriculturists of the State the means of being informed on these subjects, and let them be properly appreciated and used, and it is the decided conviction of this committee, that the annual produc-

tions of the State cannot fail to be largely increased. Let but the vast deposits of mineral, calcareous, and even vegetable materials for improvement be turned to the best advantage; and the true principles of practical Agriculture thoroughly understood, and the farming interests of Maryland will be second in point of profit to none other in the Union. The varieties of our soil, our climate and facilities of transportation cannot be surpassed, if equaled, by any other State.

To effect this, time is required—public sentiment must be prepared to appreciate the worth of such a system. And the measure proposed appears to the committee a proper introductory step, which even of itself will be productive of much practical good, and will bring about that first desirable result. When this shall have been effected, true economy will supply the means. Courses of agricultural education will be adopted in the public academies and schools; or schools for that especial purpose will be established. Agriculture will then be placed upon its proper level. It will no longer be regarded as a species of degrading drudgery, requiring neither education nor talent to understand and improve it; but will be inseparably connected with the highest branches of Natural Science upon which it is in truth dependent for its ultimate perfection.

It is only justice to add that the plan suggested first originated with a member of the Committee on Agriculture at the December session of 1840, whose zeal and exertions in behalf of this interest it should be the pleasure of every friend of Agriculture gratefully to acknowledge.

G. D. COAD, Chairman.
PETER GRABILL,
J. G. MORRISON,
WM. E. DOYLE,
A. H. SETH.

A BILL *entitled, an Act to provide for the appointment of an Agricultural Chemist for the State.*

SECTION 1. *Be it enacted by the General Assembly of Maryland,* That the Governor, by and with the advice and consent of the Senate, shall hereafter annually appoint and commission a person of ability, integrity, and suitable practical and scientific attainments as agricultural chemist for the State; and if the Senate shall have adjourned before the Governor shall make the appointment for the present year, or if a vacancy shall hereafter occur during the recess of the Senate, then the Governor alone shall make such appointment which shall be good and valid until the tenth day after the next meeting of the Senate.

SEC. 2. *Be it enacted,* That the State shall be divided into three districts; the first shall comprise that part of the State now comprised in the first gubernatorial district; the second that of the third gubernatorial district, and the third that of the second gubernatorial district.

SEC. 3. *Be it enacted,* That the said agricultural chemist shall spend one year, the first beginning on the date of his appointment, in each of said districts in the order named; it shall also be his duty to spend one month in each county and Howard district, and visit each election district.

SEC. 4. *Be it enacted,* That it shall be the duty of said agricultural chemist to analyze one specimen of each variety of soil of the county in which he shall be, that may be brought to him, or that he may find to exist, and also to examine, and if necessary analyze one specimen of each kind of marl or other mineral or vegetable deposit that may come to his knowledge, in order that his instructions may be of the more practical utility.

SEC. 5. *Be it also enacted,* That it shall also be his farther duty to deliver one public lecture, after having given timely notice thereof, in each election district in each county, and then to deliver a course of public lectures at each county town after having given also sufficient notice thereof in each election district, and he shall also permit the clerk of the levy court or of the commissioners of the tax as the case may be, to take a copy of said course of lectures to be retained and kept for the use and benefit of the county, and published by said levy court or commissioners of the tax, if to them it shall seem expedient.

SEC. 6. *Be it farther enacted,* That for the full and more satisfactory discharge of his duties, the said agricultural chemist shall be authorized to employ an assistant, whose duty it shall be to aid him in collecting and analyzing specimens of soils, marls, &c. and to render him any other assistance he may deem advantageous.

SEC. 7. *Be it enacted,* That the said chemist shall make an annual report to the House of Delegates, if in session, and if not, then to the Governor (whose duty it shall be to cause the same to be published) of his proceedings, and such other matters touching the agricultural interests of the State as may be considered necessary.

SEC. 8. *And be it enacted,* That for the faithful discharge of his duties, the said agricultural chemist shall receive the annual salary of thirteen hundred dollars, and his assistant the annual salary of seven hundred dollars, to be paid as the salaries of other civil officers are or may be paid; and for the purchase of chemical implements and materials the said chemist shall be allowed for the first year the sum of five hundred dollars in advance, and on each succeeding year a sum not exceeding two hundred and fifty dollars, out of such moneys as may be in the Treasury and not otherwise appropriated by law.

A NEW SUBSTITUTE FOR CORN.—From authentic information, recently received from the Province of Pernambuco, it appears that *Farinha de Mandioca* (or *Casava*) may be obtained in any quantity. This article forms a highly nutritious and, when properly prepared, an extremely palatable description of food. In Pernambuco it is eaten by all classes of people, without exception, and its price varies from £1 12s. 5½d. to £1 19s. 8d. per imperial quarter

LETTER XII.

SUMMER MANAGEMENT OF SHEEP.

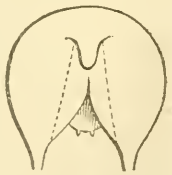
Tagging—necessity of—method of doing it...Burs—how avoided...Lambing—time of—Inclosures for—Mechanical Assistance—when rendered—assisting the Lamb—Feeding—necessary care in—Warming—Foster Ewes...Pens..."Pinning"...Numbering and Registering—advantages of—Von Thaër's System of Numbering—manner of doing it conveniently—Mr. Grove's form of a Register...Castration and Docking—proper time and method...Washing—time—necessary apparatus—"wetting"—manner of washing—ordinary waste in subsequent cleansing...Cutting the Hoofs—best time—implements—method...Time between Washing and Shearing...Shearing—proper conveniences for—catcher's business—directions to shearer—general directions...Shearing Lambs—shearing Sheep semi-annually—objectionable practices...Doing up Wool—Wool Table and Trough—handling fleece—arrangement on table—folding—rolling—tying—proper twine...Storing Wool—Wool-Room...Sacking Wool—methods...Sorting the Flock at shearing—how done...Marking Sheep—the proper way...Cold Storms after Shearing...Sun-scald...Ticks—how destroyed...Maggots—preventives...Cutting the Horns...Division of Flocks for Summer...Hopping—Clogging, &c...Dangerous Rams...Fences...Salt...Tar...Water...Shade...Weaning Lambs...Fall Feeding...Shepherd's Crook.

Dear Sir: Agreeably to your request, and that of various other Southern friends, I proceed to give directions for the practical management of sheep "plain and minute enough for the guidance of those entirely unacquainted with the subject." I will begin with their Summer Management.*

Tagging.—If sheep are kept on dry feed through the winter, they will usually purge more or less, when let out to green feed in the spring. The wool around and below the anus becomes saturated with dung, which forms into hard pellets, if the purging ceases. But whether this takes place or not, the adhering dung cannot be removed from the wool in the ordinary process of washing. It forms a great impediment in shearing, dulling and straining the shears to cut through it when in a dry state, and it is often impracticable so to do. It is difficult to force the shears between it and the skin, without frequently and severely wounding the latter. Occasionally, too, flies deposit their eggs under this mass of filth prior to shearing, and the ensuing swarm of maggots, unless speedily discovered and removed, will lead the sheep to a miserable death.

Before sheep are let out to grass, each one should have the wool sheared from the roots of the tail down the inside of the thighs, over the surface included between the dotted lines in the cut. The wool should be sheared from off the entire bag of the ewe, that the newly dropped lamb may more readily find the teat, and from the scrotum, and so much space round the point of the sheath of the ram, as is usually kept wet. If the latter place is neglected, soreness and ulceration sometimes ensue from the constant maceration of the urine.

Fig. 16.



Sometimes each tagger catches and holds his own sheep, but it is, on the whole, better, I think, to have an assistant catch the sheep and hold them while they are tagged. The latter process requires a good shearer, as the wool must be cut off closely and smoothly, or the object is but half accomplished, and the sheep will have an unsightly and ridiculous appearance, when the remainder of their fleeces is taken off;

* I have not thought it necessary to mark with quotation points, various extracts in this Letter, from a series of Letters written by me a number of years since, and published in the "Valley Farmer."

and, on the other hand, it is not only improper to cut the skin of a sheep at any time, but it is peculiarly so to cut that on the bag of an ewe near lambing. The wool saved by tagging will far more than pay the expenses of the operation. It answers well for stockings and other ordinary domestic purposes, or it will sell for something like half the price of fleece wool.

Humanity and economy both dictate that care should be taken in handling sheep at all times, and it is especially important with ewes heavy with lamb. It is highly injurious and unsafe to chase them about and handle them roughly, for even if abortion, the worst consequence of such treatment, is avoided, they become timid and shy of being touched, rendering it difficult to catch or render them assistance at the lambing period—and even a matter of difficulty to enter the cotes where it is sometimes necessary to confine them at that time, without having them driving about pell-mell, running over their lambs, &c. It may not be known to every one, that if a sheep is suddenly caught by the wool when running, or is lifted by its wool, the skin is to a certain extent loosened from the body at the points where it is thus seized, and if killed a day or two afterward, blood will be found settled about those parts. A man knowing this, and subsequently guilty of such gratuitous brutality, richly deserves to be *kicked* out of the sheep-yard. When sheep are to be handled, they should be inclosed in a yard just large enough to hold them without their being crowded—so they shall have no chance to run and dash about. The catcher should stop them by seizing them by the hind leg close above the hock, or by clapping one hand before the neck and the other behind the buttocks. Then, not waiting for the sheep to make a violent struggle, he should throw his right arm over and about it immediately back of the shoulders, place his hand under the brisket, and lift the animal on his hip. If the sheep is very heavy, he can throw both arms around it, clasp his fingers under the brisket, and lift it up against the front part of his body. He then should set it carefully on its rump on the tagging-table, (which should be 18 or 20 inches high,) support its back with his legs, and hold it gently and conveniently until the tagger has performed his duty. Two men should not be permitted to lift the same sheep together, as it will be pretty sure to receive some strain between them. A good shearer and assistant will tag 200 sheep per day.

Where sheep receive green feed all the year round, as they will do in many parts of the South, and no purging ensues from eating the newly-starting grasses in the spring, tagging will not be necessary.

Burs, &c.—If sheep are let out in the spring into pastures where the dry stalks of the Burdock *(Arctium lappa)*, or the Hound's Tongue, or Tory-weed *(Cynoglossum officinale)*, have remained standing over the winter, the burs are caught in their now long wool, and, if numerous, the wool is rendered entirely unmarketable, and almost valueless. Even the dry prickles of the common and Canada thistles, where they are very numerous, get into the neck-wool of sheep, as they thrust their heads under and among them to crop the first scarce feed of the Northern spring; and, independently of injuring the wool, they make it difficult to wash and otherwise handle the sheep. The Burdock being a large and not very frequent plant, there is no excuse for its being found on the farm. The Hound's Tongue is very prevalent in forests and partly wooded pastures in the North, and it is not conspicuous enough to be easily eradicated, though careful sheep-farmers often do so. If sheep are let into pastures containing it, it must be only in the summer and fall, after shearing. The burs,

not sunk so deeply in the short wool, will wear out during our winters—but no man thinks of letting his sheep into pastures containing it, before shearing in the spring. Indeed, sheep should be kept on the cleanest pastures—those free from these and all similar plants—during this period; and, in a region where they are pastured the year round, if such pests are not eradicated—which *I* should consider indispensable—the sheep should be kept from contact with them for some months prior to shearing.

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Lambing.—Lambs are usually dropped, in the North, from the first to the fifteenth of May. In the South, they might safely come earlier. It is not expedient to have them dropped when the weather is cold and boisterous, as they require too much care; but the sooner the better, after the weather has become mild, and the herbage has started sufficiently to give the ewes that green food which is required to produce a plentiful secretion of milk. It is customary in the North to have fields of clover, or the earliest grasses, reserved for the early spring feed of the breeding ewes; and, if these can be contiguous to their shelters, it is a great convenience—for the ewes should be confined in the latter, on cold and stormy nights, during the lambing season.

If warm and pleasant, and the nights are warmish, I prefer to have the lambing take place in the pastures. I think sheep are more disposed to own and take kindly to their lambs thus, than in the confusion of a small inclosure. Unless particularly docile, sheep in a small inclosure crowd from one side to another when any one enters, running over young lambs, pressing them severely, &c. Ewes get separated from their lambs, and then run violently round from one to another, jostling and knocking them about. Young and timid ewes get separated from their lambs, and frequently will neglect them for an hour or more before they will again approach them. If the weather is severely cold, the lamb, if it has never sucked, stands a chance to perish. Lambs, too, when just dropped, in a *dirty* inclosure, in their first efforts to rise, tumble about, and the membrane which adheres to them becomes smeared with dirt and dung—and the ewe refuses to lick them dry, which much increases the hazard of freezing.

Nevertheless, all this must be incurred in cold storms, and in sudden and severe weather; and, therefore, it should be the effort of every shepherd to teach his sheep docility. I have seen the late Mr. Grove walk about a barn filled with his Saxons, not only without their crowding from side to side, but many of them absolutely lying still while he stepped over them! I say it "must be incurred." I mean by this that it is the safest course with all breeds, and a matter of *necessity* with others. It takes but a very moderately cold night to destroy the new-born Saxon lamb, which (the pure blood) is yeaned nearly as *naked* as a child! During a severely cold period, of several days' continuance, it is almost impossible to rear them, even in the best shelter. The Merino, South-Down, and some other breeds, will endure a greater degree of cold with impunity.

Inclosures, when used for yeaning, should be kept clean by frequent litterings of straw—not enough, however, thrown on at one time, to embarrass the lamb about rising.

The ewe does not often require mechanical assistance in parturition.—Her labors will sometimes be prolonged for three or four hours, and her loud moanings will evince the extent of her pain. Sometimes she will go about several hours, and even resume her grazing, with the fore-feet and nose of the lamb showing at the mouth of the vagina. But, if let alone, Nature will generally finally relieve her. This might not do with the

heavy English breeds. I should infer not, from the elaborate directions, in the premises, by Youatt, Blacklock, and other English writers on Sheep; though with the comparatively small number of these varieties which I have bred, I have had no difficulty in this particular. Among the thousands and thousands of fine-wooled sheep which I have bred, I never have known a single instance of a false presentation of the fœtus, and never have had mechanical assistance rendered in to exceed half a dozen instances. The objection to interfering, except as a last resort, is that the ewe is frightened when caught, and her efforts to expel the lamb cease.—When aided, the gentlest force should be applied, and only in conjunction with the efforts of the ewe.

While the lamb is tumbling about and attempting to rise, and the ewe is licking it dry, it is better to be in no haste to interfere. A lamb that gets at the teat without help, and gets even a small quantity of milk, knows how to help itself afterward, and rarely perishes. If helped, it sometimes continues to expect it, and will do little for itself for two or three days.—The same is true when lambs are fed from a spoon or bottle.

But if the lamb ceases to make efforts to rise, particularly if the ewe has left off licking it while it is wet and chilly, it is time for the shepherd to render his assistance. It is better not to throw the ewe down, as is frequently practiced, to suckle the lamb, because instinct teaches the latter to point its nose *upward* in search of the teat. It is doubly difficult, therefore, to induce it to suck from the bag of the prostrate ewe; and when taught to do this, by being suckled so several times, I have invariably noticed that it renders it awkward about finding the teat *in the natural position*, when it begins to stand and help itself. Nothing is stupider than a weakly lamb! Carefully disengaging the ewe from her companions, with his *crook*, the assistant should place one hand before the neck and the other behind the buttocks of the ewe, and, then pressing her against his knees, he should hold her firmly and stilly, so that she shall not be constantly crowding away from the shepherd. The shepherd should set the lamb on its feet, inducing it to stand, if possible; if not, supporting it *on its feet* by placing one hand under its body—place its mouth to the teat, and encourage it to suck by tickling it about the roots of the tail, flanks, &c., with a finger. The lamb, mistaking this last for the caresses of its dam, will redouble its efforts to suck. Sometimes it will evince great dullness, and even apparent obstinacy, in refusing for a long time to attempt to assist itself, crowding backward, &c.; but the kind and gentle shepherd, who will *not sink himself to the level of a brute by resenting the stupidity of a brute*, will generally carry the point by perseverance. Sometimes milking a little into the lamb's mouth, holding the latter close to the teat, will induce it to take hold.

If the ewe has no milk, the lamb should be fed until the natural supply commences, with small quantities of the milk of a *new-milch* cow. This should be mixed, say half and half, with water—with enough molasses to give it the purgative effect of biestings, or the first milk—gently warmed to the natural heat (not scalded and suffered to cool), and then fed through a bottle with a sponge in the opening of it, which the lamb should *suck*, if it can be induced so to do. If the milk is *poured* in its mouth from a spoon or bottle, as already remarked, it is frequently difficult afterward to induce it to suck. And, moreover, unless milk is poured in the mouth slowly and with care—no faster than the lamb can swallow—a speedy wheezing, the infallible precursor of death, will show that a portion of the fluid has been forced into the lungs. I have known lambs frequently killed in this way.

If a lamb becomes chilled, it should be wrapped up in a woolen blanket, and placed in a warm room—giving a little milk as soon as it will swallow. A trifle of pepper is sometimes placed in the milk, and I think with good effect, to rouse the cold and torpid stomach into action. Some of the *Yankee* old ladies, under such circumstances, "*bake*" the lamb, as it is called—*i. e.*, put it in a blanket in a moderately heated oven, until warmth and animation are restored. Others immerse it in tepid water, and subsequently rub it dry. This is said to be an excellent method where the lamb is nearly frozen. I never have tried it. A good blanket, a warm room, and sometimes, perhaps, a little gentle friction, have always sufficed.

If a strong ewe, with a good bag of milk, chances to lose her lamb, she should be required to bring up one of some other ewe's pair of twins—or the lamb of some feeble or young ewe, having an inadequate supply of milk. Her own lamb should be skinned, as soon as possible after death, and the skin sowed over the lamb which she is required to foster. She will sometimes be a little suspicious for a day or two, and if so, she should be kept in a small pen with the lamb, being occasionally looked to. After taking well to it, the false skin may be removed in three or four days. If no lamb is placed on a ewe which has lost her lamb, and which has a full bag of milk, the milk should be drawn from the bag once or twice, or garget may ensue. If it does not, permanent indurations, or other results of inflammatory action will often take place, injuring the subsequent nursing properties of the animal. When milked, it is well to wash the bag for some time in cold water. It checks the subsequent secretions of milk, as well as abates inflammation. Garget will be treated under the head of Diseases of Sheep.

Sometimes a young ewe, though exhibiting sufficient fondness for her lamb, will not stand for it to suck; and in this case, if the lamb is not very strong and persevering, and especially if the weather is cold, it soon grows weak and perishes. The conduct of the dam in such cases is occasioned by inflammatory action about the bag or teats—and, perhaps somewhat by the *novelty* of her position! In this case the sheep should be caught and held until the lamb has exhausted the bag, and there will not often be any trouble afterward, though it may be well enough to keep them in a pen together until the fact is determined.

I have several times spoken of *pens*. They are necessary in the cases I have mentioned, and in a variety of others. It is therefore well for the flock-master to be always provided with a few of them for emergencies. They need not be to exceed eight or ten feet square, and should be built of light materials, and fastened together at the corners, so they can be readily moved by one, or, at the most, two men, from place to place, where they are wanted. Their position should be daily shifted when sheep are in them, for cleanliness and fresh feed. Light pine poles, laid up fence fashion, and each nailed or pegged to the lower ones, at the corners, as laid on, would make excellent ones. Two or three sides of a few of them should be wattled with twigs, and the tops partly covered to shelter feeble lambs from cold rains, piercing winds, &c.

Young lambs are subject to what is technically called "pinning,"—that is, their first excrements are so adhesive and tenacious that the orifice of the anus is closed, and subsequent evacuations prevented. The adhering matter should be entirely removed, and the part rubbed with a little dry clay to prevent subsequent adhesion. Lambs will frequently perish from this cause if not looked to for the first few days.

Numbering and Registering.—This is not absolutely necessary for the *wool-grower*, though it is, in many points of view, a vast convenience to him, and leads to a degree of system in his efforts after improvement, and gives a definiteness and precision to the execution of his plans, otherwise unattainable. But the *breeder*—he who makes it his business more particularly to raise choice animals to sell for breeding purposes—is unworthy of the name, if he does not regularly number and register his sheep, so that he can trace the descent of any ram or ewe, through any number of generations. This is not merely to gratify an idle curiosity, or to furnish a purchaser with a sounding pedigree. Every breeder is under the necessity of directly breeding in-and-in, or of occasionally employing new strains of blood. If the latter step is often resorted to, the hazard is increased of changing the character of the flock.* If he numbers and registers his sheep, he can breed "closer,"† and consequently longer, without a change, without the hazard of confusion or mistake. Where half a dozen, or even three or four rams are used in the flock the same year, it would be beyond the power of any breeder, relying on his memory alone, to decide, six or eight or ten years subsequently, which were the daughters, grand-daughters, and great-grand-daughters of each. If the rams A and B be unrelated, A may be put to the daughters of B, and then B be put to the produce, (*i. e.*, his own grand-daughter, got by A,) without "close" breeding—because they possess but *one-quarter* of the same blood. Then the great-grand-daughter may be again put to A, because she possesses but one-quarter of *his* blood. As I remarked in my last Letter, with *three* strains of blood to start with, the breeder may ring innumerable changes, without ever trenching on that line which marks the boundaries of close breeding. He who pretends that he can preserve such multiplied classifications in his memory alone, is unworthy of the least confidence.

There is another very important consideration. Numbering and registering enables the breeder to trace *breeding effects* definitely to their *causes*. Suppose that he finds that an unusual number of his young ewes are poor nurses—or exhibit some imperfection of form or wool. He can remove the *present effect* by throwing out the defective ones. But the undiscovered *cause* may still remain in operation. It may be a particular ram, or the result of interbreeding between such ram, and ewes of a certain strain of blood. If this ram, or *perhaps others got by him*, be permitted to breed, or breed with a particular class of ewes, the evil creeps along in the flock, its cause remaining undiscovered. But if the breeder could fix the precise pedigree of every sheep, from an accurately kept register, he would soon ascertain what strains of blood, or the conjunction of what strains, produced the evil. By the same means, he could as readily trace the sources of particular excellence.

The system of numbering invented by the celebrated Von Thaër is far preferable to any other which I have seen.‡ It is as follows: ||

* A ram of a new strain of blood, though of prime quality, and apparently possessing the same characteristics with the flock, does not always interbreed well with the flock in all those minute particulars which the *breeder* is bound to notice, though they might escape the eye of the ordinary flock-master. Every breeder, therefore, who has a flock that suits him, is exceedingly averse to an infusion of new blood, and resorts to it only as a matter of necessity.

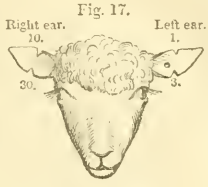
† That is, he can breed in-and-in somewhat. "*Close*" breeding is breeding between *near* affinities, such as between brother and sister, which are of the *same* blood, or between a father and a grand-daughter begotten on a daughter, which would be three-fourths of the same blood, &c.

‡ It will not cause half the mutilation of the system given in the American Shepherd—is simple, and gives the *age*, which the former does not. Neither can this system of giving the *age* be ingrafted on that system of numbering.

|| As furnished me by Mr. Grove, a number of years since, with this exception, that the point of the right ear cut square off, he made to stand for 700 instead of 500, as I have placed it. I made this change, as the notch and clip standing for 100 and 400, coming on the point of the same ear, there was no combination to express 500.

One notch over the left ear, (that which is on your left when the face of the sheep is *from* you,) stands for 1; two notches over the same, for 2. One notch under the left ear stands for 3. Three such notches carry up the number to 9. One notch over the right ear stands for 10; two such for 20. One notch under the same stands for 30; and three such for 90. Combinations of the above (three notches under each ear) would carry up the number to 99. These four classes of notches which express all parts of a hundred, are shown in the first of the annexed cuts. A sheep marked like fig. 17 would be No. 44.

Fig. 17.



No. 44—1841.

A notch in the end of left ear, as in fig. 18, stands for 100; in right do. 200. In addition to these there are on the same cut two 1 notches, one 3 notch, one 10 do., and two 30 do. Adding the whole together, the sheep would therefore be No. 375.

Fig. 18.

No 375—1843.

As the 100 and 200 notches, together, make 300, no separate notch is required for the latter number. The point of the left ear cut square off, as in fig. 19, cut, stands for 400; the point of the right cut square off, for 500. The latter and the 100 notch would make 600, and so on.

Fig. 19.

No. 909—1848.

The lambs of each year and *each sex* are numbered from 1.

The age is expressed by round *holes* through the ears, standing for the year in which the sheep is born. As there is no possibility of making a mistake of *ten* years in the age of a sheep, these marks are the same between each tenth year of the century. Between 1840 and 1850, *no* hole would express 1840; one hole in the left ear, 1841; two holes in the left ear, 1842; one hole in the right ear, 1843; one hole in the right and one in the left, 1844; one hole in the right and two in the left, 1845; two in the right, 1846; two in the right and one in the left, 1847; two in each, 1848; three in the right, 1849; none in either, 1850—and the same for the next ten years. Examples are given in the preceding cuts. In other words, one hole in the left ear signifies 1, and one in the right 3, as applied to the years between each tenth of a century—and the combinations of these holes are made to express all the intermediate years, with the exception of the tenth.

Every ewe, when turned in with the ram, should be given a mark (entirely distinct from the mark of ownership) which will continue visible until the next shearing. Nothing is better for this purpose than Venetian Red and hog's lard, well incorporated, and marked on with a cob. The ewes for each ram require a differently shaped mark, and the mark should also be made on the ram, or a minute of it in the sheep-book. Thus it can be determined at a glance by what ram the ewe was tupped, any time before the next shearing.

The holes in the ears, indicating the year, being the same on the whole annual crop of lambs, may be made at any convenient time. The holes are most conveniently made by a saddler's spring-punch, the cutting cylinder of which is about $\frac{3}{16}$ of an inch in diameter. If too small, the holes will grow up in healing.

In numbering, it is difficult to prevent mistakes, if it is deferred until

the lamb attains much size. If penned with the dams when a month or two old, hours will sometimes elapse before each lamb will suck—the only *certain* indication to which ewe it belongs. It being perfectly safe to perform this process when the lamb is only about a day old (or as soon as the lamb can walk, if it is a strong one), the shepherd carries the *notcher* in his pocket, and a little book, each page being ruled into six columns, and headed as in the register presently given. This constitutes the *day-book*, which is subsequently drawn off on the Register.

The *notcher* which I use is of my own invention, and I have found it far preferable to any I have seen elsewhere. It consists of a saddler's spring-punch—the cutting cylinder being taken out, and a little sharp chisel of the same length being screwed in its place. The edge of the chisel describes a semi-ellipsis, cutting a notch out of the ear $\frac{1}{4}$ of an inch deep, and a little over $\frac{3}{16}$ wide at the base. A triangular cut in the ear, with so narrow a base, will grow together for some distance from the apex. This instrument is far more convenient than a chisel and block.

The shepherd, on finding a lamb of the right age to mark, goes quietly up to it, stopping it by the *neck* with his *crook* if it attempts to run away. The ewe will come near enough, in a moment or two, to be secured by the *crook*, and then the shepherd notes her number and age, and enters it in his pocket-book, and also by what ram tupped. The lamb then is numbered with the *notcher*, and this and its general appearance is noted down in the appropriate columns. If the ewe is too wild to be caught, the lamb may be notched—the number of the sire, &c., entered—and the number of the ewe subsequently ascertained in the pen.

I have two forms of Breeding Registers, originally furnished me by my lamented friend, the late Mr. Grove. One contains ten columns, the other eight. I have adopted the simplest one, omitting two of the columns, which leaves the Register in the following form:

BREEDING REGISTER—1845.

No. of Dam.	*Tupp'd by Ram No.*	*Date of Lambing.*	*No. of Lamb.* Rams.	Ewes.	*Classification and Remarks.*
22—40	16—39	May 4.	1		Coarsish—wrinkly—thick, short-legged, and stout—bad crops—ewe plenty of milk, and kind.
50—41	25—42	May 4.		1	Fine—thin—long-legged—wool short—will lack constitution—ewe kind—little milk.
6—42	7—43	May 5.	2 & 3		Small, but of good shape and fine wool—No. 3 wrinkly and like sire—No. 2 more like dam.—Ewe plenty of milk, but careless.
11—41	7—43	May 5.			The lamb was born dead, very small. Same last year. This ewe had better be thrown out of breeding.

The first entry above records the following facts: "The ewe No. 22, born in 1840, tupped by the ram No. 16 of 1839, dropped on the 4th of May a ram lamb, which was marked No. 1, its character being as described under the head of 'Classification and Remarks.'"

The column of "Remarks" is a very important one, if the minutes are made with accuracy and judgment. It should include an enumeration of all the prominent characteristics of the lamb, and of the appearances of the ewe as a breeder and nurse. These records will, in a single season, decide the character of a ram as a stock-getter, and that of the ewe, in a year or two, as a breeder and nurse.

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Emasculation and Docking.—These should usually precede washing, as at that period the oldest lambs will be about a month old, and it is safer to perform the operations when they are a couple of weeks younger.—Dry, pleasant weather should be selected. Castration is a simple and safe

process. Let a man hold the lamb with its back pressed firmly against his breast and stomach, and all four legs gathered in front in his hands.—Cut off the bottom of the pouch, free the testicle from the inclosing membrane, and then draw it steadily out, or clip the cord with a knife, if it does not snap off at a proper distance from the testicle. Some shepherds draw both testicles at once with their *teeth*. It is common to drop a little salt into the pouch. Where the weather is very warm, some touch the end of the pouch (and that of the tail, after that is cut off) with an ointment, consisting of tar, lard, and turpentine. In ninety-nine cases out of a hundred, however, they will do just as well, here, without any application.

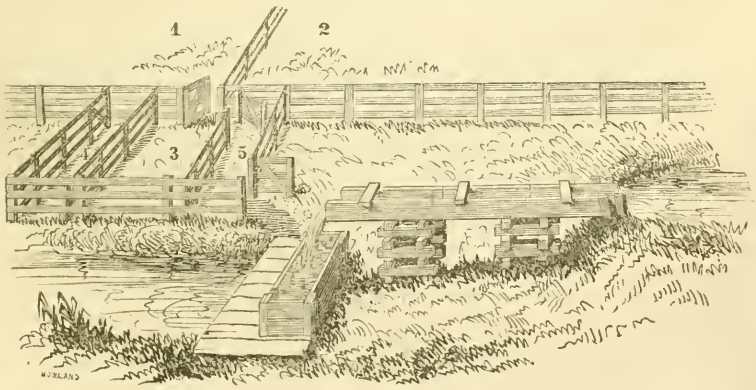
The tail should be cut off, say one and a half inches from the body, with a chisel on the head of a block, the skin being slid up toward the body with a finger and thumb, so that it will afterward cover the end of the stump. Severed with a knife, the end of the tail being grasped with one of the hands in the ordinary way, a naked stump is left which it takes some time to heal.

It may occur to some unused to keeping sheep, that it is unnecessary to cut off the tail. If left on, it is apt to collect filth, and, if the sheep purges, it becomes an intolerable nuisance.

Washing.—This is usually done here about the first of June. The climate of the Southern States would admit of its being done earlier. The rule should be to wait until the water has acquired sufficient warmth for bathing, and until cold rains and storms, and cold nights, are no longer to be expected.

Sheep are usually washed by our best flock-masters in vats. A small stream is dammed up, and the water taken from it in an aqueduct (formed by nailing boards together), and carried until sufficient fall is obtained to have it pour down a couple of feet or more into the vat. The body of water, to do the work fast and well, should be considerable—say 24 inches wide, and five or six deep—and the swifter the current the better. The vat should be say 3½ feet deep, and large enough for four sheep to swim in it. A yard is built near the vat, and a platform from the gate of the yard extends to and encircles the vat on three sides. This keeps the washer

Fig. 20.



WASHING APPARATUS.

from standing in the water, and makes it much easier to lift the sheep in and out. The cut here given exhibits all the necessary appendages. The

yard is built opposite the corners of two fields (1 and 2), to take advantage of the angle of one of them (1), to drive the sheep more readily into the yard (3). This yard should be large enough to hold the whole flock, if it does not exceed 200; and the bottom of it, as well as of the smaller yard (5), unless well sodded over, should be covered with coarse gravel, to avoid becoming muddy. If the same establishment is used by a number of flock-masters, graveling will be always necessary. As soon as the flock are confined in yard 3, the lambs are all immediately caught out from among them, and set over the fence into yard 4. This is to prevent their being trampled down, as it often happens, by the old sheep, or straying off if let loose. As many sheep are then driven out of yard 3 into the smaller yard 5 as it will conveniently hold. A boy stands by the gate next to the vat, to open and shut it (or the gate is drawn shut with a chain and weight), and two men, catching the sheep as directed under the head of tagging, commence placing them in the water for the preparatory process of "wetting." As soon as the water strikes through the wool, which occupies but an instant, the sheep is lifted out and let loose.* The vat should, of course, be in an inclosed field, to prevent their escape. The whole flock should thus be passed over, and again driven round through field 1 into yard 3, where they should stand, say, an hour, before washing commences. There is a large per centage of potash† in the wool oil, which acts upon the dirt, independently of the favorable effect which would result from thus soaking it for some time with water alone. If washed soon after a good shower, previous wetting might be dispensed with; and it is not *absolutely necessary*, perhaps, in any case. If the water is warm enough to keep the sheep in it for the requisite period, they may be got clean by washing without any previous wetting—though the snowy whiteness of fleece which *tells* so on the *purchaser*, is not so often nor so perfectly attained in the latter way. Little time is saved by omitting "wetting," as it takes proportionably longer to wash, and it is not so well for the sheep to be kept such a length of time in the water at once.

When the washing commences, two and sometimes four sheep are plunged into the vat. When four are put in, two soak while two are washed. But this should not be done, unless the water is very warm, and the washers are uncommonly quick and expert. On the whole, it is rather an objectionable practice, for few animals suffer as much from the effects of a chill as sheep. If they have been previously wetted, it is wholly unnecessary. When the sheep are in the water, the two washers commence kneading the wool with their hands about the breech, belly, &c., (the dirtier parts,) and they then continue to turn the sheep so that the descending current of water can strike into all parts of the fleece. As soon as the sheep are clean, which may be known by the water running entirely clear, each washer seizes his own by the fore parts, plunges it deep in the vat, and taking advantage of the rebound, lifts it out, setting it gently down on its breech on the platform. He then, if the sheep is old or weak, (and it is well in all cases,) presses out some of the water from the wool, and after submitting the sheep to a process presently to be adverted to, lets it go. There should be no mud about the vat, the earth not covered with sod, being graveled. Sheep should be kept on clean pastures from washing to shearing—not where they can come in contact with

* Where there are conveniences for so doing, this process may be more easily performed by driving the sheep through a stream deep enough to compel them to swim. But *swimming* the compact-fleeced, fine-wooled sheep for any length of time, as is practiced with the Long-Wools in England, will not properly cleanse the wool for shearing.

† Vauquelin, quoted by Youatt, says that it consists mostly of soapy matter with a basis of potash; 2. Carb. of potash; 3. Acetate of potash; 4. Lime; 5. Muriate of potash.

the ground, burnt logs, &c.—and they should not be driven over dusty roads.

The washers should be *strong and careful* men, and protected as they are from anything but the water running over the sides of the vat, they can labor several hours without inconvenience, and without drinking whisky until they cease to know whether a sheep is well washed or well treated, as was the bad old fashion. Two hundred sheep will employ two expert men not over half a day, and I have known this rate much exceeded.

It is a great object, not only as a matter of propriety and honesty, but even as a matter of profit, to get the wool clean and of a snowy whiteness. It will always sell for more than enough extra, in this condition, to offset against the increased labor and the diminution in weight.

Mr. Lawrence wrote me, a few years since, that the *average* loss in American Saxon wool, in scouring, (after being washed on the back,) was 36 per cent., and in American Merino 42½ per cent.!

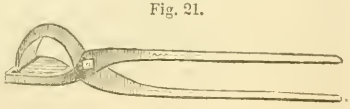
Cutting the Hoofs.—The hoofs of fine-wooled sheep grow rapidly, turn up in front and under at the sides, and must be clipped as often as once a year, or they become unsightly, give an awkward, hobbling gait to the sheep, and the part of the horn which turns under at the sides holds dirt or dung in constant contact with the soles, and even prevents it from being readily shaken or washed out of the cleft of the foot in the natural movements of the sheep about the pastures, as would take place were the hoof in its proper shape. This greatly aggravates the hoof-ail, and the difficulty of curing it—and in England it is thought to *originate* the disease.

It is customary to clip the hoofs at tagging, or at or soon after the time of shearing. Some employ a chisel and mallet to shorten the hoofs, but then the sheep must be subsequently turned on its back to pare off the projecting and curling-under side crust. If the weather be dry, or the sheep have stood for some time on dry straw, (as at shearing,) the hoofs are as tough as horn, and are cut with great difficulty—and this is increased by the grit and dirt which adheres to the sole, and immediately takes the edge off from the knife.

The above periods are ill chosen, and the methods slow and bungling. It is particularly improper to submit heavily pregnant ewes to all this unnecessary handling at the time of tagging.

When the sheep is washed and lifted out of the vat, and placed on its rump on the platform, the gate-keeper advances with a pair of *toe-nippers*, and the washer presents each foot separately, pressing the toes together so they can be severed at a single clip. The nippers shown in the cut, can be made by any blacksmith who can temper an ax or chisel. They must be made strong, with handles a little more than a foot long, the rivet being of half-inch iron and confined with a nut, so that they may be taken apart for sharpening. The cutting edge should descend upon a strip of copper inserted in the iron, to prevent it from being dulled. With this powerful instrument, the largest hoofs are severed with a moderate compression of the hand. Two well-sharpened knives, which should be kept in a stand or box within reach, are then grasped by the washer and assistant, and with two dexterous strokes to each foot, the side crust (being free from dirt, and soaked almost as soft as

Fig. 21.



TOE-NIPPERS.

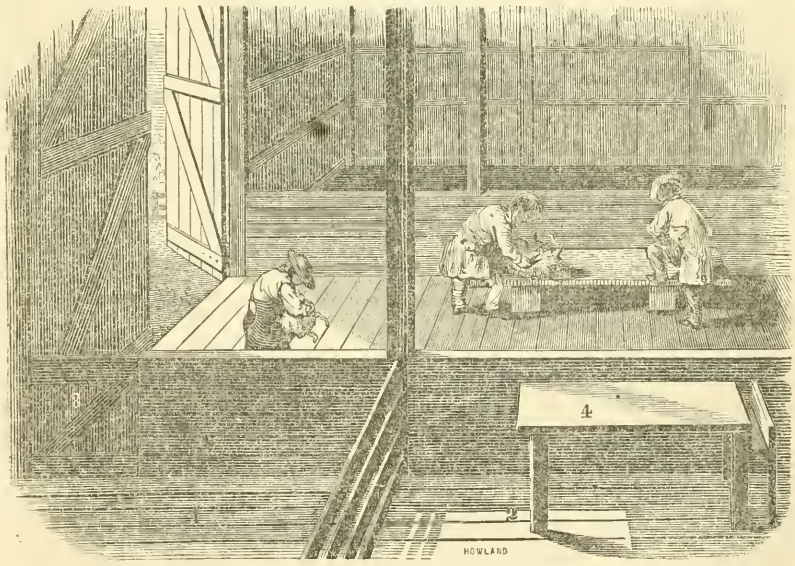
a cucumber,) is reduced to the level of the soles. Two expert men will go through these processes in less time than it will take to read this description of them!

The closer the paring and clipping, the better, if blood is not drawn. An occasional sheep may require clipping again in the fall.

TIME BETWEEN WASHING AND SHEARING.—This depends altogether on circumstances. From four to six days of bright warm weather is sufficient. If cold and rainy, or cloudy, more time must elapse. I have known the wool to remain in an unfit condition to shear a fortnight after washing. The rule is, the water should be thoroughly dried out, and the natural oil of the wool should so far exude as to give the wool an unctuous feel and a lively, glittering look. If you shear it when dry, like cotton, before the oil has exuded, you cheat yourself, and the wool will not keep so well for long periods.* If you leave it until it gets too oily, you cheat the manufacturer, or what more often happens, you lose on the price.

SHEARING—Is always done, in this country, on the threshing-floors of our barns, sometimes on low platforms, but more commonly on the floor itself. The following cut represents a common Northern barn properly arranged for this purpose.

Fig. 22.



SHEARING ARRANGEMENTS.

On the threshing-floor, three men are seen shearing—two of them using a low table or platform, say 18 or 20 inches high. The "bay"† (1, 2) nearest the eye is divided by a temporary fence, one part (1) being used for the yarding of the sheep, and the other (2) for doing up the wool, &c. The inclosure 1 should communicate by a door with another and larger yard outside of the barn. Both of these should be well littered down with

* It is also very difficult to thrust the shears through this dry wool in shearing.

† The room for storing hay, grain, &c., which is always found on one, and sometimes on each side of the threshing-floor in a Northern barn, is provincially termed a "bay"—and the low division between this and the threshing-floor a "breastwork."

straw, and fresh straw thrown on occasionally, to keep the sheep clean while shearing. No chaff, or other substances which will stick in the wool, should be used for this purpose. When the dew has dried off from the sheep, on the morning chosen for shearing, a portion of the flock sufficient to last the shearers half a day, is driven into the outside yard, and a convenient number into the bay (1). An assistant catches the sheep, lifts them off from the floor as already directed, and delivers them at the door through the "breastwork" (3) to each shearer. The shearer before taking the sheep, picks off any loose straws sticking to its wool, and if dung adheres to any of the feet, brushes it off with a little besom formed of twigs, hung up near the door for that purpose. The shearer then takes the sheep to his stand, and commences shearing.

The floor or tables used for shearing should be planed or worn perfectly smooth, so that they will not hold dirt or catch the wool. They all should be thoroughly cleaned, and, if necessary, washed, preparatory to shearing. It is the catcher's business to keep the floor constantly swept, dung removed, &c. Having a *new* stand or place swept for the shearer who has just finished his sheep, he catches him another, and then clears up the stand previously occupied. He first lifts the fleece, gathers it up so that it shall not be torn or drawn asunder, and turning his arms so as to invert it, (*i. e.*, bring the roots of the wool downward,) deposits it on the *folding-table* (4). He then picks up the "fribs" (small loose locks) left on the floor, which are deposited in a basket or on a corner of the table. Lastly, he sweeps the spot clean, to be again occupied by the shearer. An active fellow will tend four shearers, and do up the fleeces. But he should not be hurried too much, or he cannot give sufficient time to doing up. A small boy or two are handy to pick up fribs, sweep, &c.

If there are any sheep in the pen dirty from purging or other causes, they should first be caught out, to prevent them from dirtying the others.

It is difficult, if not impossible, to give intelligible practical instructions which would guide an entire novice in skillfully shearing a sheep. Practice is requisite. The following directions from the American Shepherd,* are correct, and are as plain, perhaps, as they can be made:

"The shearer may place the sheep on that part of the floor assigned to him, resting on its rump, and himself in a posture with one (his right) knee on a cushion, and the back of the animal resting against his left thigh. He grasps the shears about half-way from the point to the bow, resting his thumb along the blade, which affords him better command of the points. He may then commence cutting the wool at the brisket, and proceeding downward, all upon the sides of the belly to the extremity of the ribs, the external sides of both thighs to the edges of the flanks; then back to the brisket, and thence upward, shearing the wool from the breast, front, and both sides of the neck—but not yet the back of it—and also the poll or fore part, and top of the head. Now the 'jacket is opened' of the sheep, and its position and that of the shearer is changed, by being turned flat upon its side, one knee of the shearer resting on the cushion, and the other gently pressing the fore quarter of the animal, to prevent any struggling. He then resumes cutting upon the flank and rump, and thence onward to the head. Thus one side is complete. The sheep is then turned on to the other side, in doing which great care is requisite to prevent the fleece from being torn, and the shearer acts as upon the other, which finishes. He must then take his sheep near to the door through which it is to pass out, and neatly trim the legs, and leave not a solitary lock anywhere as a harbor for ticks. It is absolutely necessary for him to remove from his stand to trim, otherwise the useless stuff from the legs becomes intermingled with the fleece-wool. In the use of the shears, let the blades be laid as flat to the skin as possible, not lower the points too much, nor cut more than from one to two inches at a clip, frequently not so much, depending on the part and compactness of the wool."

In addition to the above, I would remark that the wool should be cut off as close as conveniently practicable, and even. It *may* be cut *too close*, so that the sheep can scarcely avoid "sun-scald," but this is very unusual.

* Pages 179, 180.

If the wool is left ridgy and uneven, it betrays that want of workmanship which is so distasteful to every good farmer.* Great care should be taken not to cut the wool twice in two, as inexperienced shearers are apt to do. It is a great damage to the wool. It is done by cutting too far from the point of the shears, and suffering the points to get too elevated. Every time the shears are pushed forward, the wool before cut off by the points, say a quarter or three-eighths of an inch from the hide, is again severed. To keep the fleece entire, so important to its good appearance when done up, (and therefore to its salableness,) it is very essential that the sheep be held easily *for itself*, so that it will not struggle violently. To hold it still by main strength, no man can do, and shear it well. The posture of the shearer should be such that the sheep is actually confined to its position, so that it is unable to start up suddenly and tear its fleece, but it should not be confined there by severe pressure or force, or it will be constantly kicking and struggling. Heavy-handed, careless men, therefore, always complain of getting the most troublesome sheep. The neck, for example, may be confined to the floor by placing it between the toe and knee of the leg on which the shearer kneels, but the lazy or brutal shearer who lets his leg rest directly on the neck, soon provokes that struggle which the animal is obliged to make to free itself from severe pain, and even perhaps to draw its breath!

Good shearers will shear, on the average, twenty-five Merinos per day, and a new beginner should not attempt to exceed from one-third to one-half that number. It is the last process in the world which should be hurried, as the shearer will soon leave more than enough wool on his sheep to pay for his day's wages.

It has been mentioned that but enough sheep should be yarded at once for half a day's shearing. The reason for this is that they shear much more easily, and there is less liability of cutting the skin, when they are distended with food, than when their bellies become flabby and collapsed for the want of it. This precaution, however, is often necessarily omitted in showery weather. It is very convenient to have the outside pen which communicates with the "bay," *covered*. On my farm, it is one of the regular sheep-houses. If it is showery over night, or showers come up on the day of shearing, a couple of hundred sheep may be run in and kept dry. And they can be let out to feed occasionally during the day on short grass. If let out in long wet grass, their bellies will become wetted. Wool *ought* not to be sheared, and *must* not be done up, with any water in it.

—

Shearing Lambs, and Shearing Sheep Semi-Annually.—Shearing lambs is, in my judgment, every way an abominable and unprofitable practice—in this climate, at least. The lamb will give you the same wool at a year old, and you strip it of its natural protection from cold when it is young and tender, for the paltry gain of the *interest* on a pound or a pound and a half of wool for six months—not more than two or three cents—and this all covered by the expense of shearing.

I am aware that it is customary, in many parts of the South, to shear grown sheep twice a year; and there may be a reason for it where they receive so little care that a portion are expected to disappear every half-year, and the wool to be torn from the backs of the remainder by bushes, thorns, &c., if left for a longer period. But when sheep are inclosed, and

*I hold that man is not *half* a farmer who has not a dash of the æsthetic mixed up with his utilitarianism. Profit should not often be sacrificed to appearances, but where they are strictly compatible, he who disregards the latter betrays a sordid and uncultivated mind.

treated as domestic animals, there may be less barbarity in fall-shearing them than in the case of tender lambs, but I cannot conceive of any better reason for it than in the former case, on the score of utility. Any gain resulting from it cannot pay the additional expense it occasions.

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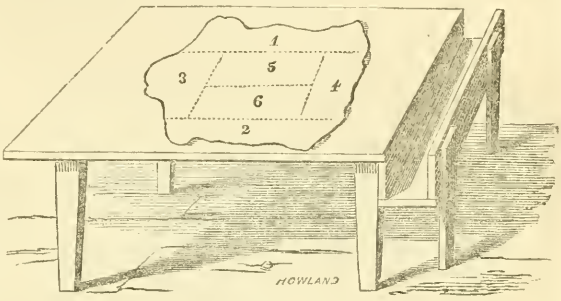
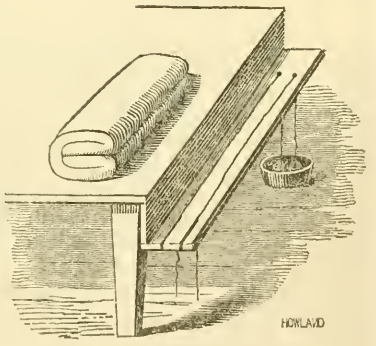
Doing-up Wool.—The fleece has been deposited on the "folding table," and he whose business it is to do it up, first proceeds to spread it out, the *outer ends upward*, bringing every part to its natural relative position.—The table, with a fleece spread out on it, is represented in fig. 23. The table should be large—say five feet wide and eight long—that, if necessary, several *unspread* fleeces may be put upon it at the same time, and still give room for spreading one. It should be about three feet high. After the fleece is spread, dung, burs, and all other extraneous substances are carefully removed from it with a pair of shears. It is then pressed together with the hands, so that it will cover but little if any more space than it would occupy on the skin of the animal, if that was placed *unstretched* on the table. About a quarter of the fleece, lengthwise, or from head to tail, (represented by 1 in the above cut,) is then turned or folded in *(inverting* it,) toward the middle. The opposite side (2) is next folded inward in the same way, leaving the fleece in a long strip, say 18 inches wide. The forward end (3) is then folded toward the breech, to a point (represented by dotted line) corresponding with the point of the shoulder. The breech (4) is next folded toward the head. The fleece now presents an oblong square represented by 5 and 6. On the breech, in a small, compact bunch—so they can be, subsequently, readily separated from the fleece—the clean fribs are placed. They do not include "trimmings," (the wool from the shanks,) which should not be done up in the fleeces. The fribs may be laid in at some earlier stage of the folding—but if thrown on top of the fleece, as is very customary, before it is folded at all, they *show through*, if the latter gets strained apart, as it frequently happens in the process of rolling—and being coarser and perhaps less white than the fine shoulder wool, they injure the appearance of the fleece. The fleece is now folded together by turning 5 over on to 6, and the tyer carefully sliding it around on the table with his arms, so that the shoulder shall be toward him, it appears as in fig. 24, ready to go into the wool-trough. The wool-trough, which is above represented

Fig. 23.



FOLDING-TABLE.

Fig. 24.

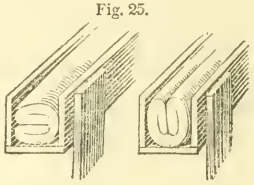


WOOL-TROUGH.

with one of its sides off, to exhibit the interior arrangement, should form a part of the table, and should be about 9½ inches wide and 9 deep, and its length corresponding with the width of the table, would be five feet. Near its back end, and about one-third of its width from each side, gimlet holes are bored just large enough for the passage of ordinary wool-twine. Two balls of twine are placed in a vessel beneath, the ends passed through the holes, and the whole length of the trough, and are fastened in front by being drawn into two slits formed by sawing a couple of inches into the bottom of the trough. The holes and slits should be small enough, so that the twine will be kept drawn straight between them.

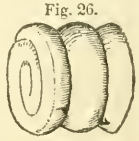
The tyer placing his hands and arms (to the elbow) on each side of the fleece folded as above, now slides it into the trough. There are two methods of having it lie in the trough, represented by the following cuts. That on the left is the more ordinary, but not the best method. It will bring to the two *ends* of the done-up fleece (the parts most seen in the wool-room) the ridge of the back and two lines half way down each side of the sheep. The former is sometimes a little weather-beaten, and if any hay-seeds have fastened in the fleece, they show most on the back.* And the two lower lines are a little below the choicest wool.—Placing it in the trough as in the right-hand figure, rolling would bring both ends of the fleece from the wool between four and five inches from the ridge of the back, the choicest part of the fleece. Besides, the edges of the breech fold, which is not so fine as the shoulder, which sometimes show by the first method of rolling, are always concealed by the last.

Fig. 25.



The wool being in the trough, the tyer steps round to the back end of it, and commences rolling the fleece from the breech to the shoulder. He rolls it as tightly as possible, pressing it down and exerting all the strength of his hands—minding, however, not to tear the outside fold—or strain it so apart as to exhibit the *outer* ends of the next inside layer or fold. When the rolling is completed, he keeps it tight by resting the lower part of his left arm across it, reaches over with the right, and withdrawing one of the ends of the twine from the slit, places it in the left hand. Then seizing the twine on the other side of the fleece with his right hand, he draws the twine once about the fleece with his *whole strength*, and ties it in a hard or square knot. The fleece will then keep its position, and the other twine is tied in the same way. The twines should be drawn with a force that would cut through the skin of a tender hand in a few moments.† The twines are then cut within an inch of the knots, with a pair of shears. The fleece is *slid* out of the *end* of the trough, when it will be a solid, glittering mass of snowy wool, in the shape shown in the cut on the right. If well and tightly done up, however, the divisions given on the end of the fleece, in the cut, to exhibit the foldings, will not be perceptible—and nothing but an unbroken mass of the choicest wool of the fleece.

Fig. 26.



FLEECE.

The twine should be of flax or hemp, and of the diameter of ordinary sized hardware twine. Cotton might do, if smooth and hard enough so that no particles of it could become incorporated with the wool—in which event it does not separate from the wool in any of the subsequent processes, and receiving a different color from the dyes, spots the surface of the cloth.

* Hay-seed, or rather its chaff, will not wash entirely out of wool.

† It is customary with some tyers to wear a glove on the right hand—or cots on the two fore-fingers.

It is scarcely necessary to remark that it is considered perfectly fair by the purchaser, to take all the pains above recommended, to "put the best side out" in doing up wool, provided every fleece is done up by itself. He expects it, and graduates his prices accordingly. He who neglects it, therefore, cheats himself. But to do up coarser fleeces, or any parts of them, in finer ones—put in "trimmings"—leave in dung—or use unnecessary twine—are all base frauds. Sometimes the careless sheep-owner will have his wool filled with burs, which he cannot or will not remove. In that case he is bound to unequivocally apprise the buyer of the fact, and allow him to open fleeces until satisfied of the precise extent of the evil.

—

Storing Wool.—Wool should be stored in a clean, tight, dry room. It is better that it should be an *upper* room, for reasons presently to be given, and it should be plastered, to exclude dust, vermin, insects, &c. Rats and mice love to build their nests in it, to which they will carry grain chaff and other substances, injuring much wool—and it is singular that if accessible to the common bumble-bee, numbers of their nests will be found in it. A north and pretty strong light is preferable for a wool-room.

When the wool-tyer removes each fleece from the trough, he places it in a long, high basket, capable of holding a dozen fleeces, and it is immediately carried to the wool-room—or he piles it on the clean floor in the inclosure in which his table stands, to be subsequently carried away. In either case, the fleeces are not thrown down promiscuously, which injures their shape, but are laid regularly one above another, on their sides. In the wool-room it is laid in the same way in smooth, straight north and south rows (supposing the light to be let in from the north) with alleys between, in which a man can pass to inspect the wool. The rows ought not, perhaps, to be more than two deep, so that the end of *every* fleece can be examined, but as it cannot be piled up more than about four fleeces high in this way, without liability of falling, it is customary to make the rows three or four fleeces deep—laying the lower ones a little wide, so that the pile may slightly recede as it goes up. In this way they may be piled six fleeces high. Where the character of the flock is known, or that of the seller relied on, it makes little difference. It is considered fairest to pile the fleeces without any discrimination as to quality, in the wool-room.

—

Sacking Wool.—When the wool is sold, or when it must be sent away to find a market, it is put up in bales nine feet long, formed of 40-inch "burlaps." The mouth of the sack is sowed, with twine, round a strong hoop (riveted together with iron, and kept for the purpose,) and the body of it is let down through a circular aperture in the floor of the wool-room.* The hoop rests on the edge of the aperture, and the sack swings clear of the floor beneath. A man enters the sack, and another passes the fleeces down to him. After covering the bottom with a layer, he places a fleece in the center and forces down others around it, and so on to the top, which is then sowed up. Each fleece should be placed regularly with *the hands*, and then stamped down as compactly as possible, so that the bale when completed shall be hard and well filled in every part. The bulk of a given weight of wool will be greatly affected by the care with which this process is performed.

Those who do not expect buyers to come and look at their wool, sack it immediately after shearing. A temporary scaffolding is erected near

* It is to secure this convenience that the wool-room is best placed on the second floor.

the wool as deposited by the tyer, and one man tosses up fleeces to a second, who catches them and passes them down to the man in the sack. A light frame, to suspend the sack, and *part way up it* a standing-place for the catcher, would be a convenient appendage to the establishment of a wool-grower who does not store his wool in a wool-room. With a set of stairs up to his midway standing-place, an active fellow would keep the treader supplied, without any assistance.

In the absence of any agreement, the price of wool, delivered at the residence of the purchaser, does not include the cost of sacks and sacking. It is customary, however, for growers of small parcels, and those who keep no conveniences for sacking, to carry their wool tied up in sheets, &c., and deliver it to the purchaser at the nearest village or other point, where he has made arrangements for sacking.

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Selection.—The necessity of annually weeding the flock, by excluding all its members falling below a certain standard of quality, and what the points are to which reference should be had in establishing that standard, have already been sufficiently adverted to in discussing the principles of breeding. The time of shearing is by far the most favorable one for the flockmaster to make his selection. He should be present on the shearing-floor, and inspect the fleece of every sheep as it is gradually taken off. If there is a fault about it, he will then discover it better than at any other time. A glance, too, reveals to him every fault of form, previously concealed wholly or in part, by the wool, as soon as the newly shorn sheep is permitted to stand on its feet. He takes down the number and age of the sheep on his tablet, and if not sufficiently defective in form or quality of fleece to call for its condemnation, in a pair of scales suspended near the wool-tyer's table, he determines the weight of the fleece. If this, too, is satisfactory, he marks "*retained*" opposite the sheep's number on his tablet. If more or less defective in any point, he weighs this against the other points—taking also into consideration the age of the sheep, its character as a breeder, its nursing properties, quietness of disposition, &c.—and then, in view of *all* these points, the question of retention or exclusion is settled. A remarkably choice ewe is frequently kept until she dies of old age. A poorish nurse or breeder would be excluded for the lightest fault, and so on. I have been in the habit, for a number of years, of using a book kept for this purpose, each page being ruled and headed thus :

Number.	*Qual. of Fleece.*	*Form.*	*Wt. of Fleece.*	*Conclusion.*
27, '42	p.	f.	4½	r.
30, '44	o.	b.	4	e.

The figures in the first column signify No. 27 of the year 1842, and No. 30 of the year 1844. The letters in the succeeding columns stand for the words "prime," "fair," "ordinary," and "bad"—marking the gradations of quality. The letters in the last column signify "retained," or "excluded." Such a record will lead to far greater accuracy than by any other method, and it is extremely valuable for purposes hereafter to be stated.

If the sheep are not numbered, the flock-master should note each appearance, as above directed, have the sheep held by the neck by an assistant, or discharged by the shearer into a small pen at the door for that purpose, until the fleece is weighed, and then if he decides to exclude it, he gives it a small mark on the shoulder, consisting of Venetian Red and hog's lard, (conveniently applied with a brush or cob.)

Marking Sheep.—The sheep should be marked soon after shearing, or mistakes may occur. Every owner of sheep should be provided with a marking instrument, which will stamp his initials, or some other distinctive mark, such as a small circle, oval, triangle, square, &c., at a single stroke, and with *uniformity*, on the sheep. It has been customary here, to have the mark cut out of a plate of thin iron, with an iron handle terminated by wood. But one made by cutting a type or raised letter (or character) on the end of a stick of light wood, such as pine or basswood, is found to be better. If the pigment used be thin, and the marker be thrust into it a little too deeply, as often happens, the surplus will not run off from the wood, as from a thin sheet of iron, to daub the sides of the sheep, and spoil the appearance of the mark; and if the pigment be applied *hot*, the former will not, like the latter, get heated, and increase the danger of burning the hide. Various pigments are used. Many boil tar until it will assume a glazed, hard consistency, when cold, and give it a brilliant black color by stirring in a little lamp-black when boiling. It is applied when just cold enough not to burn the sheep's hide, and it forms a bright, conspicuous mark the year round. I have always used this, though the manufacturer would prefer the substitution of oil and turpentine for tar, as the latter is cleansed out of the wool with some difficulty. I boil it in a high-sided iron vessel (to prevent it from taking fire) on a small furnace or chafing-dish near where it is to be used. When cool enough, forty or fifty sheep can be marked before it gets too stiff. It is then warmed from time to time, as necessary, on the chafing-dish. The rump is a better place to mark than the side. The mark is about as conspicuous on the former, under any circumstances, and it is more so when the sheep are huddled in a pen, or when they are running away from you. And should any wool be injured by the mark, that on the rump is less valuable than that on the side. It is customary to distinguish ewes from wethers by marking them on different sides of the rump.

Many mark each sheep as it is discharged from the barn by the shearer. It consumes much less time to do it at one job, after the shearing is completed; and it is necessary to take the latter course, if a hot pigment is used.

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Cold Storms after Shearing.—These sometimes destroy sheep, in this latitude, soon after shearing—particularly the delicate Saxons. I have known forty or fifty perish out of a single flock, from one night's exposure. The remedy, or rather the preventive, is to house them, or in default of the necessary fixtures to effect this, to drive them into dense forests. I presume, however, this would be a calamity of rare occurrence in the "sunny South."

—

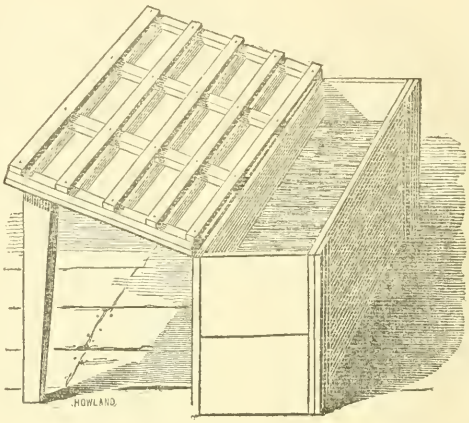
Sun-Scald—Might be more common. When sheep are sheared close in very hot weather—have no shade in their pastures—and particularly where they are driven immediately considerable distances, or rapidly, over burning and dusty roads, their backs are so scorched by the sun that the wool comes off. It is not common, however, here. You may see one such in a flock of a hundred. Let alone, the matter is not a serious one, but the application of refuse lard to the back will accelerate the cure, and the starting of the wool.

—

Ticks.—These, when very numerous, greatly annoy and enfeeble sheep in the winter, and should be kept entirely out of the flock. After shearing, the heat and cold, the rubbing and biting of the sheep soon drive off

the tick, and it takes refuge in the long wool of the lamb. Wait a fortnight after shearing, to allow all to make this transfer of residence. Then boil refuse tobacco leaves until the decoction is strong enough to kill ticks beyond a peradventure. This may be readily tested by experiment. Five or six pounds of cheap plug tobacco, or an equivalent in stems, &c., may be made to answer for 100 lambs. The decoction is poured into a deep, narrow box, kept for this purpose, and which has an inclined shelf one one side, covered with a wooden grate, as shown in the cut. One man holds the lamb by the hind legs, another clasps the fore-legs in one hand, and shuts the other about the nostrils to prevent the liquid entering them, and then the lamb is entirely immersed. It is immediately lifted out, laid on one side on the grate, and the water squeezed out of its wool. It is then turned over and squeezed on the other side. The grate conducts the fluid back into the box. If the lambs are regularly dipped every year, ticks will never trouble a flock.

Fig. 27.



DIPPING-BOX.

The effect of tobacco water in scab, will be hereafter adverted to.

—

Maggots.—Rams with horns growing closely to their heads, are very liable to have maggots generated under them, particularly if the skin on the surrounding parts gets broken in fighting, and these, if not removed, soon destroy the sheep. Both remedy and preventive is boiled tar—or the marking substance heretofore described. Put it under the horns, at the time of marking, and no trouble will ever arise from this cause. Sometimes when a sheep scours in warm weather, and clotted dung adheres about the anus, maggots are generated under it, and the sheep perishes miserably. Preventive: remove the dung. Remedy: remove the dung and maggots, the latter by touching them with a little turpentine, and then apply sulphur and grease to the excoriated surface.

Maggot flies, says Blacklock, sometimes deposit their eggs on the *backs* of the long, open-wooled English sheep, and the maggots during the few days before they assume the pupa state, so tease and irritate the animal, that fever and death are the consequence. Tar and turpentine, or butter and sulphur, smeared over the parts are given as the preventives. The Merino and Saxon are exempt from these attacks.

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Shortening the Horns.—A convolution of the horn of a ram sometimes so presses in upon the side of the head or neck, that it is necessary to shave or rasp it away on the under side, to prevent ultimately fatal effects. The *point* of the horn of the ram and ewe both not unfrequently turn in so that they will grow into the flesh and sometimes into the eye, unless shortened. The toe-nippers will often suffice on the thin extremity of a horn, but if not, a fine saw must be used. The marking time is the best one to attend to this.

Division of Flocks.—It is customary at, or soon after shearing, to make those divisions in large flocks, which utility demands. It is better to have not to exceed two hundred sheep run together in the pastures, though the number might perhaps be safely increased to three hundred, if the range is extensive. Wethers and dry ewes to be turned off, should be kept separate from the nursing-ewes, and if the flock is sufficiently numerous to require a third division, it is customary to put the yearling and two-year-old ewes and wethers and the old, feeble sheep together. It is better in all cases to separate the rams from all the other sheep, at the time of shearing, and to inclose them in a particularly well-fenced field. If put even with wethers, they are more quarrelsome, and when cool nights arrive, will worry themselves and waste their flesh in constant efforts to ride the wethers. The Merino ram is a quiet animal compared with the common-wooled one, but poor fences, or fences half the time down, will tempt him to jump, and if once taught this trick, he becomes very troublesome as the rutting period approaches, unless hoppling, yoking, clogging, or "poking" is resorted to—either of which causes the animal to waste his flesh and strength, and are the causes of frequent accidents.

Hoppling, Clogging, &c.—Hoppling is done by sowing the ends of a leathern strap (broad at the extremities so that it will not cut into the flesh) to a fore and hind leg, just above the pastern joints—leaving the legs at about the natural distance apart. Clogging is fastening a billet of wood to the fore leg by a leather strap. Yoking is fastening two rams two or three feet apart, by bows around their necks, inserted in a light piece of timber, say two by three inches in size. Poking is done by inserting a bow in a short bit of light timber, into which bit (worn on the under side of the neck) a rod is inserted which projects a couple of feet in front of the sheep. These, and similar devices, to prevent rams scaling fences, may be employed as a last resort, by those improvident farmers who prefer by such troublesome, injurious, and at best, insecure means, to guard against that viciousness which they might, so much more easily, have prevented from being acquired.

Dangerous Rams.—From being teased and annoyed by boys, or petted and played with when young—and sometimes without any other stimulant than a naturally vicious temper—rams occasionally become very troublesome by their propensity to attack men or cattle. I know of one for which his owner has refused $250, which will permit no man to enter the field with him without making an immediate onset on him. I have known several that would knock down the ox or horse which presumed to dispute the possession of a lock of hay with them. A ram which is known to have acquired this propensity should at once be *hooded*, and, if not valuable, at the proper season converted into a wether by "cording." But the courage thus manifested, is usually the concomitant of great strength and vigor of constitution—and of a powerfully developed frame. If good in other particulars, it is a pity to lose the services of such an animal. I have in several such instances hooded them, by covering their faces with leather in such a manner that they could only see a little backward and downward. They must then, however, be kept apart from the flock of rams, or they will soon be killed or injured by blows, which they cannot see to escape.

It sometimes happens that a usually quiet tempered ram will suddenly exhibit some pugnacity when you are salting or feeding the flock. If you turn to run, you are immediately knocked down, and the ram learns, at

that single lesson, the secret of his mastery, and the propensity to exercise it. The ram giving his blow from the summit of the frontal bone on the *top* of the head, (and not from the forehead,) couches his head so low when he makes his onset, that he does not see forward well enough to swerve suddenly from his right line, and a few quick motions to the right and left enable you to escape him. Run in upon him, as he dashes by you, with pitchfork, club, or *boot-heel*—punishing him severely by blows, (about the head if the club is used,) and giving him no time to rally until he is thoroughly cowed.*

—

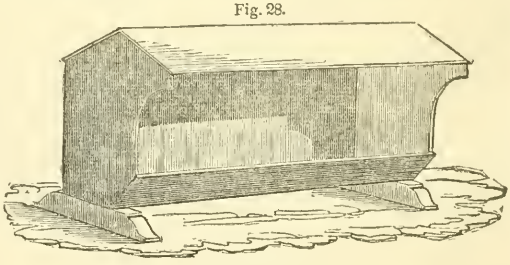
Fences.—Poor fences will teach ewes and wethers to jump, as well as rams, and for a jumping *flock* there is no remedy but immoderately high fences, or extirpation. One jumper will soon teach the trick to a whole flock, and if one by chance is bought in, it should be immediately hoppled or killed. The last is by far the surest and safest remedy.

—

Salt.—Salt, in my judgment, is indispensable to the health of sheep, particularly in the summer—and I know not a flock-master among the hundreds, nay, thousands with whom I am acquainted, who differs with me in this opinion. It is common to give it once a week while the sheep are at grass.

It is still better to give them free access to salt at all times, by keeping it in a covered box, open on one side, like the following:

Fig. 28.



SALTING-BOX.

A large hollow log, with holes cut along the side, for the insertion of the heads of the sheep will make a respectable substitute. A sheep having free access to salt at all times, will never eat too much, and it will take its supply when and in what quantities Nature demands, instead of eating voraciously at stated periods, as intermediate abstinence will stimulate it do. When fed but once a week, it is better to have a stated day, so that it will not be forgotten, and it is well to lay the salt on flat stones, though if laid in little handsfull on the grass, very little will be lost.

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Tar.—This is supposed by many to form a very healthful condiment for sheep. The nose of the sheep is smeared with it, and it is licked and swallowed as the natural heat of the flesh, or that of the weather, causes it to trickle down over the nostrils and lips. Others, suffering the flock to get unusually salt hungry, place tar upon flat stones, or in troughs, and then scatter salt on it, so that both shall be consumed together. Applied to the nose, in the nature of a cataplasm, I have no doubt that it is advantageous in catarrhs—and put on the same place, at the proper periods, it may perhaps, by its odor, repel the visitations of the fly *(Œstris ovis)*, the eggs of which produce the "grub in the head." As a *medicine* it may be valuable, and even as a *detergent* in the case specified, but as a condiment

* This may be pronounced harsh "measure for measure," and some may think it would tend to increase the viciousness of the animal. Repeated instances have proved the contrary to me. And if their mastery is once acknowledged, it is never forgotten by them.

simply, for a perfectly healthy animal, I confess I have no confidence in its utility.

—

Water.—Water is not indispensable in the summer pastures, the dews and the succulence of the feed answering as a substitute. But my impression is decided that free access to water is advantageous to sheep, particularly to those having lambs; and I should consider it a matter of importance on a sheep farm, to arrange the pastures, if practicable, so as to bring water into each of them.

—

Shade.—No one who has observed with what eagerness sheep seek shade in hot weather, and how they pant and apparently suffer when a hot sun is pouring down on their nearly naked bodies, will doubt that, both as a matter of humanity and utility, they should be provided, during the hot summer months, with a better shelter than that afforded by a common rail fence. Forest-trees are the most natural and best shades, and it is as contrary to utility as it is to good taste to strip them entirely from the sheep-walks. A strip of stone-wall or close board fence on the south and west sides of the pasture, will form a passable substitute for trees. But in the absence of all these, and of buildings of any kind, a shade can be cheaply constructed of poles and brush, in the same manner as the sheds of the same materials for winter shelter, which will be described in my next Letter.

—

Weaning Lambs.—Lambs should be weaned at four months old. It is better for them, and much better for their dams. The lambs when taken away should be put for several days in a field distant from the ewes, that they may not hear each other's bleatings. The lambs when in hearing of their dams, continue restless much longer, and they make constant and frequently successful efforts to crawl through the fences which separate them. One or two tame old ewes are turned into the field with them to teach them to come at the call, find salt when thrown to them, and eat grain, &c., out of troughs when winter approaches.

The lambs when weaned should be put on the freshest and tenderest feed. I have usually reserved for mine the grass and clover sown, the preceding spring, on the grain fields which were seeded down.

The dams, on the contrary, should be put for a fortnight on short, dry feed, to stop the flow of milk. They should be looked to, once or twice, and should the bags of any be found much distended, the milk should be drawn and the bag washed for a little time in cold water. But on short feed, they rarely give much trouble in this particular. When properly dried off, they should be put on good feed to recruit, and get in condition for winter.

—

Fall Feeding.—In the North, the grass often gets very short by the 10th or 15th of November, and it has lost much of its nutritiousness from repeated freezing and thawing. At this time, though no snow has yet fallen, it is best to give the sheep a light daily foddering of bright hay—or a few oats in the bundle. Given thus for the ten or twelve days which precede the covering of the ground by snow, fodder pays for itself as well as at any other time during the year. I have usually fed oats in the bundle, or threshed oats, (about a gill to the head,) in the feeding-troughs, carried to the fields for that purpose.

—

The Crook.—This implement has been several times alluded to as a convenient one for catching sheep. It is made in the form exhibited in

the cut, of $\frac{3}{8}$-inch round iron, drawn smaller toward the point—and the point made safe by a knob. The other end is furnished with a socket, which receives a handle six or eight feet long. The manner of using it is thus described in Mr. Stephens's admirable "Book of the Farm":

Fig. 29.

SHEPHERD'S CROOK.

"The hind-leg is hooked in at *a*, from behind the sheep, and it fills up the narrow part beyond *a*, while passing along it until it reaches the loop, when the animal is caught by the hock, and when secured, its foot easily slips through the loop. Some caution is required in using the crook, for should the sheep give a sudden start forward to get away, the moment it feels the crook the leg will be drawn forcibly through the narrow part, and strike the bone with such violence against the bend of the loop as to cause the animal considerable pain, and even occasion lameness for some days. On first embracing the leg, the crook should be drawn quickly toward you, so as to bring the bend of the loop against the leg as high up as the hock, before the sheep has time even to break off, and being secure, its struggles will cease the moment your hand seizes the leg."

No flock-master should be without this implement, as it saves a vast deal of yarding, running, &c., and leads to a prompt examination of every improper or suspicious appearance, and a timely application of remedy or preventive—which would often be deferred if the whole flock had to be driven to a distant yard, to enable the shepherd to catch a particular sheep.

Dexterity in the use of the crook is speedily acquired by any one; and if a flock are properly tame, any one of its number can be readily caught by it, at salting-time—or, generally, at other times, by a person with whom the flock are familiar. But it is at the lambing-time, when sheep and lambs require to be so repeatedly caught, that the crook is more particularly serviceable. For this purpose, at this time alone, it will pay for itself ten times over in a single season, in saving *time*, to say nothing of the advantage of the sheep.

Summering Manure.—Notwithstanding all that has been said and written showing that fresh manure immediately applied to the land, or such as is preserved in tanks or under cover, or by a mixture with straw or earth, is at least four times the value of that left in the barn-yard all summer exposed to sun and rain, wasting its richness in the air and drenching its fertilizing salts away; yet many farmers still believe, or act upon the principle of belief that manure is like cider, growing better with age; and thus their dung is safely kept in the yard till August or September, a great nuisance to all around, and a sad loss to the growing crops. We are well aware that rotted manure is considered indispensable for certain crops, and therefore may say they prefer to sustain the loss of its rotting to the inconvenience of using it in an unfermented state. Let those who thus think consider that when manure has become rotted it is then mere humus or vegetable matter, such as decomposed leaves of trees, straw, hay, corn-stalks, muck, turf, peat, road and ditch scrapings, which may be had on every farm to answer the same purpose as rotted manure. How many farmers let all these substances go to waste, thus subjecting themselves to a double loss—a depreciation in the value of their manure, and a neglect of the vegetable matters on their premises and around them.

Chloride of Soda.—Chloride of soda is said, in the London Lancet, a medical work, to be an effectual cure for a burn. It is stated in that journal, as an example, that an attorney, in attempting to put out the flames that had attacked the curtains of his bed, got his hands burned and blistered, but not broken. He sent for a couple of quarts of the lotion, four ounces of the solution to a pint of water, had it poured into soup-plates, wrapped his hands in lint, as no skin was broken, and so kept them for some time. Next morning he was so perfectly well that only one small patch of burn remained, yet an hour had elapsed before the application. It is added that the same remedy is sufficient to heal scalds and black eye.

THE LATE MR. COKE, OF HOLKHAM, ENG.

TRIBUTE TO HIS MEMORY AND WORTH, BY HON. ANDREW STEVENSON.

At their late Anniversary Meeting, Mr. Stevenson met a call from the ancient Agricultural Society of Albemarle to address them; and all that we have room to say is, that those who heard him ought to be very wise already or must be very hard to move, if they fail to profit by such an appeal to their understanding and their interests.

The orator exposed in vivid colors the faults that characterize and the doom that seems to await the cultivators of that noble old Commonwealth, and with equal eloquence and truth indicated some of the ways to reform and salvation. But, after all, if the landed interest does not flourish, if population does not thicken and prosper, and the land itself increase in value, it cannot be for want of knowledge in a community for whom the principles and the implements for right cultivation have been so well explained and illustrated, as they have been for the good people of Albemarle, for the last forty years, by such men as Jefferson, Madison, Taylor, James Barbour, J. M. Garnett, J. H. Cooke, Ruffin, W. C. Rives, the Randolphs and the Minors. Well enough do we know that some will read, with a certain curl of the lip, the names of Jefferson, and Gov. Randolph, and Mr. Madison, as among the benefactors of Agriculture. With a blended air of triumph and derision, these contemners of book-knowledge!—of theoretical Agriculture! would point you to their farms and to their balance-sheet of profit and loss! As well might they say that the Philadelphia glazier, the inventor of the *quadrant*, not being a practical navigator, could do nothing for the safety of ships and the lives and property they bear. As well might they say that that "idle and incorrigible boy," inventor of the *safety-lamp*, could add nothing to the mineral resources of a Kingdom, because he was not a practical coal-heaver! For our humble selves, much prouder should we be to have explained and illustrated, as did the author of the Declaration of Independence, the mechanical principles to be carried out in the form of a *mould-board*—or to have invented, as did Governor Randolph, the *hill-side plow*—or to have written such beautiful and philosophical addresses as were pronounced by Mr. Madison and Mr. Rives, before the same Society, the former some twenty-eight years back, than to receive a vote of Congress for having, by military stratagem or *coup de main*, sent 50,000 of our fellow-creatures into eternity.

No, it cannot be for the want of practical knowledge that such men, of so much general intelligence, so inquisitive, and so well instructed in the art of cultivation, can produce and keep on an area of near 40,000,000 of acres, not one-fifteenth of the number they might clothe—ay, and feed in the bargain. Whence is it, then, that little Massachusetts, with a tenth of her soil, and in nowise to be compared with hers in fertility or climate, is rapidly gaining on Virginia in point of numbers and power, and sending away out of her prolific hive thousands at the same time to populate the West? It cannot be from any natural inertness or sluggishness of the blood in the sons of the Old Dominion, famous for the high temper and spirit of her men and her horses; it cannot be for the want of great men, for she has more great men than all New-England united. Without great men to manage her affairs, the affairs

of New-England seem to manage themselves. It cannot be that Virginia languishes under the weight of banks and corporations, for which she has a cordial antipathy from her palmiest days to the present. New-England, so thriving, so out of debt, so prosperous, has, we are told, "no great men nor any little men;" they seem to be all alike, as bullets from the same mould, and all shooting ahead. As for corporations, of banks and railroads, no country can equal her. Her banks are at once the most numerous and the safest in the world; their stock is most widely diffused; so are their loans. It is there as easy to make a bank, if men have the money, as to make up a sweepstake in the South. The people have the sagacity to facilitate the views of those who have capital to lend; if a man have a ten-dollar note he can buy stock with it within the smoke of his chimney, and put it at interest; and within the same distance any industrious man can borrow money to give activity to his genius and his industry. There is not a farm that has not within a very short distance *non-producing consumers* of agricultural produce ready to buy the smallest thing that can be made on it for sale. A man may engage for certain a purchaser for the butter yet in his cow's udder, and the eggs that he knows his hens will lay in the morning. It cannot be that Virginia languishes because she avoided speculation in railroads and manufactories, for these thrifty Yankees have made more railroads than any other people in the world; and as for manufacturers, besides supplying enough of them to consume every peck of apples and every string of onions that can be made in the State, so that no capital need be lying dead in an acre of waste land, they send the produce of their manufactories to the British Possessions, and pay duty, and *undersell the old Mother, while she pays none.* What is it, then, say, ye friends in Virginia? Will you penetrate the secret, and let us know? Is there some radical difference in the domestic policy of the two States, or something partial, and pernicious to the interests of Virginia, in the action of the common parent Government? Pray think it over; it behooves you to find it out. Is it that you are all *producers, and no consumers*, think ye? That a vast proportion of the products of your labor is consumed in the wear and tear and *cost of exchanging it for what you get in return?* Don't you want to have the lap-stone, and the loom, and the iron-miner, and the coal-heaver, to come and sit down along side of you, as recommended by Mr. Jefferson? Shall we look for a solution in Professor Tucker's Tables of the relative numbers employed in Agriculture and in Manufactures in the New-England States, where all are thriving, all out of debt, and in the Southern States, where an immense proportion of every man's estate lies so much dead capital in waste land, from which his children are running away. Let us look at these proportions, and let every man draw his own conclusion. Here, then, is the exhibit: in 1810 the proportion employed in the New-England States was, out of 100, in *Agriculture* 72·8; *Commerce* 6·2; *Manufactures* 21. In 1840, twenty years afterward, the proportion employed in Agriculture had *diminished* from 72·8 to 66·7, while those employed in Manufactures had *increased* from 21 to 30·2. In that year, 1840, in the six New-England States, for every 66 persons employed in Agriculture, there were, close alongside of them, *thirty manufacturers*, ready to consume whatever they had to sell—a pint of raspberries or a pound of butter—a gallon of milk or a gallon of cherries—and ready at the same time to buy their wool and to supply them with coats—to buy their raw hides and supply them with shoes. *Here 's one, and there 's the other!* No time lost in exchanges. The New-England farmer spends all his time and keeps all his manure *on his*

farm. Well, now, look at the six Southern States—(we are speaking of agriculturists, mind ye; we need not care for others, for *they! they!* will take care of themselves.) In these Southern States, then, the proportion is 90 employed in Agriculture, with 1·2 in Commerce and 8·3 in Manufactures, as purchasers of agricultural produce—in one section about two producers for one consumer; in the other, eleven for one! In one, the producer and consumer, close together or connected by the very best of roads—in the other, far apart, exchanging at great cost of time, labor and money. We have imported, last year, it seems, more than one hundred millions of dollars' worth of goods. Suppose the people of the United States, not a *party*—for that is ever ready to uphold the worst and to oppose the best measures, and taints whatever it touches—but as *one people* were to give out, and let Europe and the *whole world* understand that we meant to make these $100,000,000 ourselves—what would be the effect? Would we not bring over the *men* and the *machinery* and the *millions of capital* along with them, and then, when the people would be *here*, to eat the farmer's produce of every sort on the spot, and to buy and supply with the *least possible cost of exchange*, would not our people stay at home, and lands, instead of going to waste, be all drained and ditched and planted in fruit and cabbages and potatoes, instead of only a very small proportion of it, in only one or two or three staples? And then could we not raise honestly, and above board, by *direct taxation*, enough to support the Government at one-half the cost the landed interest pays now, under a fraudulent and cunning invention of politicians and great men to wheedle and cheat them; and would not our sons stay at home—should we not have concentration, to which the laws of Nature lead, instead of dispersion and decline—might we not dispense with armies and wars and preparations for wars, for which the farmer has always to stand as ultimate paymaster? We only "ask for information."

Virginia is fifteen times larger than Massachusetts, with richer land, better climate, more coal, more iron, more water-power, can raise all sorts of produce in greater quantity per acre, wool included, suppose, then, she had within her borders fifteen times as many non-producing consumers of agricultural produce to supply with wool, beef, coal, iron, mutton, potatoes, fruit, butter, cheese, timber, corn, flour, rye, oats, onions, leather, oysters, fish, wood, bacon and cabbage, as Massachusetts has of that class of people—fifteen times 85,000 manufacturers would be 1,275,000—suppose they consumed *altogether* an *average* of 25 cents a day, they would want of what is produced out of the land, $116,345,750 a year! What would land be worth then? Would not the people that are flying off stay at home, and would not the young men settle near their fathers, and their sisters all get married? Would we not have concentration instead of dispersion? And then, what would be needed would be a plain, honest, direct tax for the support of the Government. Let the farmer know exactly what he does pay, and for what he pays it. Let him have, once a year, a *bill of particulars*, in the plainest terms; and *then*, and not till then, will the landed interest be brought to understand and to control the price he pays for being governed.

We only throw out these intimations for our readers. If there be any interest in which we feel a sincere, unaffected, *anxious* concern, next after the personal safety and well-being of our immediate family, it is the *landed interest of the country.* We are satisfied there is *something rotten in the state of Denmark* that depresses and scatters where we should have concentration and prosperity. *What is it?*

As for Mr. Stevenson's address and Mr. Rives's that preceded it, we only wish

we had room for them both, but the addresses delivered would make volumes of themselves. One thing we must say, that nothing argues worse—nothing more clearly evinces the want of the true tone and spirit in the agriculturists of Virginia so much as that the local *party papers*, of which they have so many, and who may be supposed to know something of what public sentiment demands, should have felt themselves *at liberty* to withhold such Addresses as these.

EXTRACT FROM MR. STEVENSON'S ADDRESS.

And here Mr. President, I cannot forbear alluding to one extraordinary and distinguished farmer of England, to whom not only she, but the whole world, are indebted, as one of the greatest patrons of Agriculture, and benefactors of Man. I allude to the late Lord Leicester, better known as Mr. Coke, of Holkham, the great farmer commoner of England and the devoted friend of America and all Americans. I can speak of him and his farms, with some degree of accuracy, as it was my good fortune to obtain his friendship and regard, during my residence in England, and spend many weeks with him in the country. This celebrated Holkham estate, (or rather farms, for it is divided into many,) contains many thousand acres. The house, one of the most magnificent piles of architecture in the kingdom, covers an entire acre of ground; the immediate pleasure grounds ten acres, and the park eight or nine miles in circumference, and had just been entirely inclosed with brick, when I paid my first visit. The house was built by the first Earl of Leicester and his wife about 1734, and they dying without children, it descended to Mr. Coke the nephew, as the next of kin. He was then quite young. It remained totally neglected until he took possession of it on reaching his majority, with no means however to cultivate, or improve it. He was advised to pull down the house, sell the bricks, and dispose of the lands at any price or abandon them. It was about this period that, speaking of the poverty of Holkham, one of the females of the Walpole family wittily said of it, "that there was always two rabbits contending for one blade of grass." Its character and poverty however admit of no doubt, for over the door of the entrance hall is the following remarkable inscription in marble.

"This Seat, On An Open Barren Estate
Was Planned, Planted, Built, Decorated,
And Inhabited, The Middle Of The 18th Century,
By Thomas Coke, Earl Of Leicester."

On taking possession of the estate the first effort was to sell. He offered it at 2s. 6d. an acre, but, being unable to get even that, he determined to borrow the necessary funds and reclaim it. He did so, removed to it in his twenty-second year and devoted himself to it for life. Amid the prejudices, ignorance and apathy of the people of Norfolk, he continued firm and resolute, and kept to his opinions and persevered for years with all his characteristic energy of purpose. Then it was that things began to change. Men of talent and enterprise began to take up the matter. The people were awakened out of the sleep which precedes dissolution to consider and reflect on the subject, and their duties; and in less than a quarter of a century, his patriotism and industry triumphed over ignorance and apathy, and a poor barren estate that could neither be sold nor cultivated, in its then state, was made a perfect garden spot, yielding an income of 40 shillings or more an acre, and producing average crops in later years of forty to fifty bushels of wheat and more to an acre. It was during one of my visits, that he told me that he had lived to see all his expectations more than realized and justified; and that one of the most gratifying things, connected with his agricultural life was, that only a few months before, he had embarked with his wife and four sons on board of a vessel which was launched at Wells, a small town near Holkham, which had been built out of *Oak produced from acorns* of his own planting! He was then I suppose more than eighty, and of course the oak was some sixty years old! I will not suffer myself to speak of the extent and vastness of the estate, created as it were by one man alone and unassisted. To give you, however, from certain data, an idea of the extent and character of the cropping, I will read an extract from a Treatise on Practical Farming and Grazing, by C. Hilliard, Esq. a distinguished agriculturist, published in 1837, and a copy of which he was good enough to present to me. In page 32 he says:

"At Holkham the wheat, being short in the straw, is mowed with a cradle scythe: youths, women and boys, immediately following the mowers, binding it up (assisted by horse-rakes) into sheaves, which, as the straw is free from weeds, if the weather is particularly fine, they will carry without setting the sheaves up in the usual manner in shocks. I was at Holkham, about eight days, in the year 1831, at the time wheat was harvesting, and a most animating sight it was. I counted above one hundred, men, women, and boys, employed in one large field. In this way, *three hundred and forty-five acres* of wheat were cut, carted and stacked, in six days. This was getting on with wheat harvest more expeditiously, perhaps, than is in the power of any other person in the kingdom. I saw at the same time, *four hundred and fifty acres* of turnips, of different sorts, and mangel-wurzel, in which Mr. Coke challenged me to find a single weed, excepting some that might have just sprung up out of the ground. I could not see one weed that was three

or four inches long, and this was clean farming on a large scale as probably could not be seen in any part of the world."

Now I call upon our anti-scientifics and of the "Good Enoughs," to explain how these results could have been produced under any circumstances, upon such an estate as this was, without the aid *of the most high and finished system of scientific cultivation!* One field of three hundred and forty-five acres producing between fourteen and fifteen thousand bushels of wheat, and four hundred and fifty acres more in luxuriant "turnips!" Why gentlemen, it must strike the imaginations of these friends of ours as more like the enchantments of fable and story than sober reality. But why speak of him as the most remarkable agriculturist that ever lived? It is matter of history and not to be questioned! Will you pardon me, in referring to what one of the distinguished writers of the day says of him and his farming:

"The country and not alone the country, but the world, it may truly be said, acknowledges the benefits of Mr. Coke's exertions in the advancement of the first of Arts. For himself, both as regards his happiness and his after report to posterity, nothing could have been more full of congratulation than his early selection of such a study. To prosecute with such advantage any pursuit to such a period; to enjoy so long a duration of uninterrupted health: to see the patrimony of his ancestors improved beyond all possible computation; to know that from his example, his spirit, his skill, and his encouragement, not alone his own estate, not the country where he lived, not the country itself only, but every civilized nation on the face of the globe, may be said to owe some portion of obligation to his labors; to be able to assemble the curious, the scientific, and the eminent, in vast numbers around him; to hear his just praises spoken from the lips not only of men distinguished in arts, in arms, and in letters, but of princes of his own and foreign lands. All these together form an aggregate of fortune that attends but a very few among those who are born and die. Yet such is the consummation (and a proud spectacle it is both for the individual and for his country) that Holkham has existed—and that, under Divine Providence, Mr. Coke has been made the instrument of diffusing so many and such great blessings among mankind."

But, Mr. President, there is another circumstance, of a personal character, connected with our country and one of my visits to Holkham, which I ought not to omit to notice. It is strongly illustrative of the long cherished attachment of that distinguished individual to America and her free institutions. Mr. Coke and myself were walking one morning through the saloon and stopped opposite to a full-length portrait of himself, taken in his twenty-second year. It was painted by Gainsborough. You see, he said, that I am taken in my shooting costume, with gun in hand, and pointers in the group. Now do you know that this is one of my favorite pictures and said to be the finest likeness ever taken of me; but I have often wished that there had been one change in it, and that is, instead of the shooting dress, gun, and pointers, he had represented me in my ordinary dress of blue coat, leather breeches, boots and spurs, with the *Declaration of American Independence*, in my hand supporting, with Fox, a motion for acknowledging it. I should then have hung it side by side with the portrait of that great and good man, by Sir Joshua Reynolds, the finest likeness ever taken of him. We were devoted friends, and often congratulated one another on the part we had taken in favor of American Independence; and that we had never voted to put one penny of unnecessary burden upon the people, or shed one drop of human blood! He afterward gave me a printed copy of the Report of the forty-third anniversary of the Holkham Sheep Shearing in 1821, which lasted four days, and was attended by one thousand persons, including some of the Royal family, and many of the distinguished noblemen of England, with farmers from all parts of the country. From this report let me read an extract from a speech delivered by Mr. Coke, at dinner, on one of the days, in answer to a toast complimentary to himself, and prefacing one he intended giving:

"Mr. Coke, in proposing the next toast, said every one knew his early respect for the Americans, for their manly and independent assertion of their liberties: he came into Parliament previous to the commencement of that disastrous War which divided the two countries, and which under a mild and wise Government, might have been joined hand in hand, and thus united might now have bid defiance to the rest of the world! I was the only member (said Mr. Coke) out of twelve from this county who voted against that War, and I thank God for it—I look back with satisfaction to that conduct, and have followed the same principles ever since. The motion to put an end to that War was carried by a majority of one, the vote being 177 to 178. When it was carried, Lord North moved that the debate should stand over till the following day, but Mr. Fox suggested to me to move that the address be carried up to the throne. The debate lasted until 7 o'clock the next morning, and Lord North, seeing that not a man would stir, at length gave way, and I carried up the address as an English country gentleman, in my leather breeches, boots and spurs. But would you believe it that the traitor General Arnold, when I presented the address, stood as near to his Majesty as I now do to the Duke of Sussex, a most lamentable proof of that fatal policy of which we have long seen the evil effects! Mr. Coke concluded by proposing the health of Mr. Weeks of America, and he could assure the company that every day during the War did he drink GENERAL WASHINGTON as the greatest man upon earth."

And well may England place among her first men, and her most beneficent benefactors, the man who shed such a lustre upon her Agriculture, and that of the world. He did for the Agriculture of England, what *John Hampden* did for the liberties of Englishmen against tyranny. And if the reward of popular praise, and popular honors, are due to those who, guided by a wise philosophy, and whose objects have been the welfare and improvement of mankind, then are they due to Thomas William Coke.

BETEL-NUT, AND CHURRUS:

AN EXTRACT FROM HEMP—ITS CURIOUS QUALITIES—CURE FOR TETANUS OR LOCKJAW, ALSO FOR WORMS IN HORSES AND DOGS—A SUBSTITUTE FOR TOBACCO, PERHAPS.

In relation to the action of the *Betel-Nut*, Mr. Haggar, connected with the East India Company service, says: "No one ever thinks of giving anything to a dog having worms but the betel-nut. The natives invariably use them. I have not given a horse calomel for worms since 1832. Whenever the indications of these parasites are manifested, such as a staring coat, impaired condition, loss of appetite, &c., I withhold half the dose of aloes, and substitute one or two drachms of the betel-nut in powder, adding a little more ginger, and it turns out the worms like a 'broom in a gutter.' I think the betel-nut has only to be known in England, to come into *general use*. Its charcoal has been long extolled for making the best tooth-powder known." Now, so far, there seems to be not much resemblance or affinity between betel-nut and tobacco; but we thought the hint as to its qualities as a vermifuge might be useful to every farmer. It is not known, but inquiry shall be made of our friend Milhau, of Broadway, at the head of the College of Pharmacy, New-York, and to be depended upon with unbounded confidence on the score of intelligence in his profession and probity in everything—whether it has been imported and tried in this way in our country; he will know, and if not he will take care to import some. But we are coming now to present it in other aspects bearing a closer similitude to *Nicotiana tabacum*.

Sir Richard Phillips (we are not sure whether it be the learned author of the History of Fruit-Trees, and the History of Vegetables) says the betel belongs to the same tribe of plants as the peppers—a climbing plant with a leaf in shape and appearance resembling that of ivy, but more tender and full of juice. He adds: "There is an incredible consumption of betel-leaf throughout the East. The inhabitants chew it almost incessantly, and in such quantities that their lips become quite red, and their *teeth black*, a color *greatly preferred by them to whiteness!* They carry it in little white boxes about their persons, and present it to each other by way of compliment and civility, in the same manner that [Americans] do snuff. This is done by the *women* [only think of it!] as well as the men, and it would be considered an offence if those to whom it is offered should refuse to accept and chew it. The leaves are sometimes used alone, but much more commonly when covered with a kind of lime made of sea-shell and wrapped around slices of the areca-nut, the fruit of the areca palm, which is of the size of a small egg, and resembles a nutmeg deprived of its husk." Professor Burnet says: "Slices of the betel-nut wrapped in a leaf of the betel pepper is a favorite masticatory in Southern Asia. A little shell-lime is added to keep the taste and odor longer in the mouth. It gives the saliva a red hue like that of blood, and by constant use the teeth become blackened; it allays hunger, and is hence chewed, as tobacco is in Europe, to appease the appetite; and it is said to be the hight of rudeness in the East to speak to a superior without having *a quid* of betel in the mouth. It produces intoxication when first chewed, but this effect is soon got over, and the natives say that it is a tonic, and moderates profuse perspiration."

Now we leave to the judgment of impartial readers to decide between the *betel-nut* and the *tobacco leaf*, which is the more refined luxury of the two, barring the *black teeth;* and here, again, we may say—*de gustibus.* There is nothing of which it behooves us more to disabuse ourselves than of the prejudices of education, habit, and country. It is somewhere related that a man of erect and athletic form being cast on the shore of an island inhabited by hump-back people, was stoned to death as a monster of deformity. If anything so repulsive as is tobacco, on being first tasted, can become an article almost of necessity with those accustomed to use it, why may it not be changed for a more compact and genteel substitute? Not only do we see individuals, but whole nations change in character, that is to say their manner of seeing and feeling, effected most frequently by changes in the form of their government, or rather, we might say, by corruption and fraud in the spirit of its administration. Who would believe, for example, that a Roman Emperor once said of the Parisians, "I love them because their character, like mine, is austere and serious!"

But we are getting into a moralizing strain, and may ourselves, peradventure, be considered as under the influence of some uncommon hallucination. In regard to tobacco, as we have a month to back and fill upon, as to anything essential in a practical view, after having given the best directions at hand for making the *beds*, the professional and general reader may not be displeased that we take room for what we find about that other drug, "*Churrus*," especially if the Asiatic cholera should follow in the wake of the potato cholera, as it seems to be doing in Europe. It may be well, too, in the way of advertisement to our medical readers, who will pardon the supposition that some of them may not have seen the following or a similar account of it. The positive assertion, too, that it has been found effectual in cases of lockjaw is alone sufficient to commend it to the notice of the humane of all classes, and to justify us in lugging it in in almost any connection, without reference to its narcotic effects, which seem to assimilate it so strongly to our weed.

This drug was, about three years since, presented to the Veterinary Medical Association, with the following note from Doctor Hoey:

"*My Dear Sir:* Be pleased to accept the accompanying drug, which I have brought from India. I do not know whether it is generally known in this country; the Indian name for it is "churrus;" it is a resinous extract obtained from the wild hemp. I have seen *several cases of tetanus cured by it in India.* The dose I have given is one scruple, in the form of tincture, every four hours, the patient having been first copiously bled, and the bowels frequently acted on by aloes. It has also been used by human surgeons for the cure of cholera with great success; in fact, there *are few cases but have yielded to it, when taken in time.* Perhaps you are already acquainted with it; if so, pardon the liberty I take in sending it to you, since I do so under the impression that it may not be generally known. The natives of India use it to smoke in their hookas, combined with spices and tobacco, and with it they perfectly stupefy themselves; and when they recover from its effects say they have had heavenly dreams. It is much similar to opium in its narcotic effects, but differs from that drug by not producing the same amount of debility subsequently.

"Believe me, my dear Sir, yours very truly and obliged, J. W. HOEY.

"To Mr. MORTON."

"In India," says Professor Burnet, "*hemp* is cultivated as a luxury, and used *solely as an excitant.* It possesses peculiar intoxicating powers, and produces luxurious dreams and trances. The leaves are *sometimes chewed* and sometimes smoked *as tobacco.*" We recollect to have once heard the late William Pinkney, unequaled as an orator at the bar, say that on the eve of a great cause he could never so well concentrate his thoughts and arrange all his armor for the coming conflict as when puffing his fragrant Havana in a mood of abstraction. Mr. Ley, too, says, in a paper read before the Medico-Botanical Society, London,

that, "the resin of the *Cannabis Indica* is in general use as an intoxicating agent, from the farthermost confines of India to Algiers. If this resin be swallowed, almost invariably the inebriation is of the most cheerful kind, causing the person to sing and dance, to eat food with great relish, and to seek aphrodisiac enjoyment. The intoxication lasts about three hours, when sleep supervenes; it is not followed by nausea or sickness, nor by any symptoms, except slight giddiness, worth recording. These effects are much modified in this country, and much less marked, possibly from the length of the voyage rendering the article deteriorated in value. The subsequent effects are depression of spirits, and relaxation of the muscles in a marked degree; yet the lightness attending that relaxation, the free perspiration on the skin, and the increase of appetite, have made some old rheumatic persons speak of it as the elasticity of youth."

In taking space to record these curious facts, besides the amusement they may afford, it is confessed that the principal motive is to suggest that in these drugs may be found the means of relieving our domestic animals, especially those faithful ones the horse and the dog, in critical cases of illness. Gratitude, nay common humanity, invites us to diffuse a knowledge of every means that may save not only their lives, but even a moment of speechless suffering—instead whereof how many such do men wantonly inflict?

LYFORD'S PRICE CURRENT.

PRACTICAL HINTS TO GROWERS OF INDIAN CORN.

We heartily welcome the return to our desk of an old and familiar friend, under the above title. If any man has a tact for the office of gathering up and arranging statistics—agricultural and commercial—with judgment and perspicuity, Mr. Lyford has, either by nature or education or both. To this expression of our poor opinion we are prompted no less by good will for the man than the thanks we have often owed to the editor for articles like the following. Thorough cleaning and thorough *drying*, such as is afforded by the use of the Stafford Rotary Dryer, will go far toward substituting our Indian corn, in England, for their oil-cake and oatmeal, and thus may be opened a new, improving and permanent market for the plant which should take, on our arms, the place of the ravenous and plundering bird of prey, and, more than the sword, be esteemed the glory of America. The following, among his notices to correspondents, by the learned editor of the London Gardener's Chronicle, is extracted only to show how familiar they are getting with the use of our Corn Meal:

Management of Cattle—*F P B M*—You can feed your cattle perfectly on hay, Linseed, *Maize*, and water, and litter them comfortably with Fern and leaves; and we should prefer doing so and obtaining the manure for our turnips, to buying guano at £11 11s. per ton. You can probably buy oat-straw cheaper than hay: given as chaff soaked in hot linseed soup, and sprinkled with *Indian corn meal*, it will feed well.

Among the same notices Professor Lindley, who seems to be extensively engaged in practical farming, says:

Farm Horses—Our horses are now eating about one cwt. of hay and nearly 2½ bushels of oats apiece weekly.

This goes to show, as we have often insisted, what an enormously expensive agricultural machine a live horse is. Say for the year, 2½ tons of hay and 125 bushels of oats. Now we turn to two papers on our table for the price of these

articles, and the calculation is the fairer as one is from *Boston* (the "Ploughman") and the other the Baltimore American, thus showing the price in different parts of the country. The first says that hay, within 20 miles of Boston, has averaged $15 a ton for 30 years past; the other gives the present price of oats at Baltimore at from 35 to 40 cents. Well, say 35 and the expense of each horse kept up and at constant work is rather more than $80 a year, or $160 for a pair of horses, for feed alone, being the interest on about $2700!! What think you of that, gentlemen keepers of superfluous horses? Then again remember that a *grub* the size of a horse-bean, or a touch of the colic, kills him and you lose your capital altogether—a fortunate riddance if you can possibly do without the horse. How different with the thrifty Yankee who in lieu of the horse plows his 1¼ acres a day with his patient oxen that are ready to work every day of the year, and at the end of their lives give him 1600 weight of prime beef, worth, at 4 cents a pound, $64.

See how much more expensive to keep a horse than a man,—13 bushels of corn a year, or a peck a week, is an abundant allowance for a man. Then, according to the experience of the President of the Agricultural Society of Saratoga County, 100 pounds of meat, with "garden sauce," is all sufficient. The corn at 60 cents a bushel, will amount to $7 80. The meat at, say, 6 cents, $6. Total $13 80, or more than six men for one horse; or add for the man's clothing equal to his food, and say nothing about the shoes and tackle of the horse, and you can keep three men for one horse. But the horse is useless without a man, whereas there are many kinds of work that a man can do without a horse. After all, be it remembered, $80 for every horse you keep where he is constantly kept up, worked, and fed, and where hay is worth $15 a ton, and oats 35 cents a bushel.

There is not a foot of land in Prince George's or Ann Arundel county that might not be worked with great saving by mules or oxen; nor is there a horse team in a wagon in either that travels as fast as would Mr. Blagden's Devon oxen with a Yankee driver. But, between them all, we have been run away with and forgotten the extract from friend Lyford:

Corn and the Forthcoming Crop.—We have more than once, recently, been requested to say something by way of caution to farmers, (if peradventure any remarks we make might reach and be regarded by them,) in reference to the condition in which they have hitherto brought their crops to market, and the great necessity which experience has taught buyers—to be careful in future how they operate in the article.

Farmers ought to be very particular in cleaning and preparing their corn for market. The large shipments made last season to Europe have imparted knowledge to shippers to a greater extent than they before possessed, for which, in the shape of losses, many of them have paid high prices, and this will admonish them to take better care for the future. The forthcoming crop of the United States this year will be unprecedentedly large, reaching probably 525,000,000 bushels, so extra large has been the breadth of ground planted; and this immense amount will be disposed of in various ways: Much of it will find its way to Europe, where, as that which reached there last season was well received, so will likewise be this and subsequent receipts—and much will be consumed at home, as flour will, in all probability, be scarce and high during winter in the Atlantic markets—and in the West, stocks of cattle and hogs will be fed with it, and large quantities will be distilled. To enable farmers, then, to obtain good or saving prices, it will be necessary to have the article freed from all foreign matter, as the presence of any uncleanness not only injures the *appearance* but likewise the *flavor;* and as underwriters will no longer take risks on corn shipped in bulk, bags must be procured by shippers who are not disposed to pay freight for more than they can avoid. Farmers, therefore, will readily perceive the necessity, for their interest as well as reputation, to bring their corn to market properly cleaned, and thereby obtain good prices, instead of having it abounding with foreign matter, which the shipper will have to remove before he can bag and put it on shipboard, for which he will deduct *in his mind* the expense thus incurred. We are borne out in our opinion, aside from what purchasers have stated to us, by the following:

The New-York Express says:—"A vast portion of the embarrassment that has overtaken

many of the large flour and grain houses in England and different parts of the continent, has been occasioned by the injudicious manner in which shipments of grain have been made. The demand for breadstuffs was so great, that corn, wheat and rye were sent forward in the utmost hurry; everything in the shape of a vessel was loaded—and most of them without any judgment. The consequence has been that many have foundered at sea; others have never been heard from, and a large number have been compelled to return, or put into some foreign port with cargoes shifted and damaged. These have occasioned some losses and disappointments. But yet a greater evil has been experienced from the want of care in having the grain properly dried and prepared previous to being shipped. A very large portion of the grain sent out, has been found, on arrival, to be so heated and damaged as to be worth less than the mere freight. It is doubted, by men well skilled in the trade, whether one-half of the Indian corn that was shipped from this country last year reached England in a sound state. If this is correct, it is easily explained why the losses have been so great and so ruinous.

"Taught by experience, shippers now endeavor to profit by the past, and are shipping their corn mostly in bags, and in such a thoroughly dry state that those cargoes now going forward will reach their destination without injury.

"Corn, during most of the last season, cost 100 cts. freight 60, and other charges 30 to 40—making the aggregate about two dollars, laid down in Liverpool. Now, the cost is 70 cents, freight 15 cents, and other charges 25—making the whole cost about 110 cents. If prices should run down to 50 cents when our immense crop comes in—which will be a large price—corn can now be sent to England at less than a dollar a bushel, or about one penny sterling or two cents a pound. Oatmeal, which is the poorest breadstuff in the kingdom, was selling, at the last low prices, at 1½ penny or three cents a pound."

The above was intended for the December number. The reader can easily make any allowance necessary for change of prices, if any since that date.

ROTATIONS AT SPRINGFIELD, MD.

SHORT DESCRIPTION OF A GREAT SYSTEM, LEADING TO GREAT RESULTS.

It would require more time and care than we can now bestow to describe Mr. George Patterson's Springfield estate, in Maryland, near Sykesville, on the Baltimore and Ohio Rail Road.

It is a large estate, of some 12 or 1500 acres of undulating, and when he took it, very poor, unproductive land. He has limed a large portion of it, to the tune of some $30,000; but then, instead of his crops not paying for the seed and the harvesting, he now gathers, we opine, some sixty bushels of corn, twenty of wheat, and from one to two tons of best hay to the acre; and, as we believe, he feeds all his hay and corn on the land, and provides well-littered stables and shelters for his horses, cattle, sheep, and hogs, it may be supposed that the action of the lime, and the results of his whole system, are much advanced by the addition of a *great quantity of manure.*

We made a flying visit to Springfield lately, in company with Mr. Wierman of Baltimore, and should have been abundantly repaid if only in viewing an imported North Devon Bull, sent out by Mr. Bloomfield, surrounded by six and twenty of the sleekest and most beautiful cows and heifers we ever beheld, up to their eyes in the *aftermath* of an 18-acre grass lot, from which he had cut more hay this year than was yielded by the whole estate when he took possession of it. But, as before intimated, we can 't attempt here anything like a detail of the products of the several fields, at that time and since, and the processes followed from year to year. The *outline* of the system will be seen in the following extract for which we asked, only because of our laboring under the misfortune of a most unfortunate memory, none the stronger for belonging to a mind somewhat overcharged with labor and care.

But on the occasion referred to, our notice was attracted by the most extraordinary *horticultural display* that ever met our eyes, unless it were a field of onions at the Shaking Quaker village at Lebanon. In this case it was a large lot of *mammoth cabbages.* We should like much to have ascertained the weight of the largest. The size we would not venture to state if we had not such a good backer as Mr. Wierman in anything that he will undertake to back. We will, therefore, aver that he assisted us to measure the diameter of one, not the largest in the lot, but the largest among those very near where we were passing. The measurement was upward of *four feet across!*

It grew on an old dunghill, and had once on it a very large dose of lime. The whole weight of that crop of cabbages to the acre, and the quantity of milk it would produce from such cows, supposing *a pint of Indian corn meal to go along with each head of cabbage,* would be a thing to be talked about—it would! The last field we rode hastily over, on leaving Springfield, was one with a strong grass sward being turned up in the best style for exposure to the winter's frost to kill the grubs and prepare the land for corn next spring. On this lot his whole system has been now consummated, and next spring is to be renewed. In reply to a request for a brief memorandum of the course through which it had gone, we were favored with the following. We "guess" this large field will produce not less than 60 bushels to the acre, instead of, probably, not over 12 when it was brought under this course of improvement, nine years ago.

SPRINGFIELD, Oct. 23, 1847.

Dear Sir:—You asked me, when you were here, to give you the course that had been pursued with a field then being plowed for corn next year. It has twice gone through the rotation of cropping I follow.

1st year, in corn; 2d year, small grain; 3d year, clover, plastered—first crop mowed, second crop left on the ground; 4th year, clover, grazed *moderately;* 5th year, wheat; 6th year, timothy, mowed; 7th year, timothy, mowed; 8th and 9th years, in pasture. I invariably put the manure on the surface when the land is in timothy. I also apply the lime when the land is in grass. I use 200 bushels of unslacked stone-lime to the acre, either in one or two applications: that quantity, in all, appears to be sufficient for my land.

Yours truly, GEORGE PATTERSON.

MONTGOMERY COUNTY LANDS.

EFFECT OF GUANO AS SHOWN BY EXPERIENCE.

[Extract.] WOODLANDS, Montgomery Co., Nov. 1, 1847.

My location is on the Big Seneca, and I again beg leave to refer you to Mr. Farquhar's description of lands adjacent to that stream. Our soil is a clay, intermixed with small but numerous particles of stone, and retains improvement where improved, longer than almost any lands I am acquainted with. *Guano* acts on all the lands in our county, where it has been applied, as it has been in a number of places this season, like a charm. Indeed it is charming to the heart to see the beautiful verdure of the wheat fields, as you pass them, giving a promise of a bountiful yield. The contrast between their present and former appearance is indeed wonderful, and would be incredible but for the known efficacy of the powerful agency of guano. By way of experiment I procured one ton of that article in the fall of 1845, and applied on about eight acres of my poorest land, the product from which was equal to improved land adjacent. Last year I applied nearly three tons to my wheat land, and one ton on my corn land. The wheat land had only recently been inclosed, and was poor indeed. I purchased it a short time since because it lay contiguous to my other land. Owing to a break in the canal my guano did not reach me until some time in November,

and was then applied at the rate of nearly 200 pounds, mixed with 72 pounds of plaster per acre. The appearance of the wheat after it came up astonished, and was the admiration of every person who passed the public road that runs immediately by it; and, notwithstanding it was so late sown, and the uncommon drouth of two months' duration last spring, yielded an average of 9 bushels of wheat to the acre—but, previous to the drouth, promised to be good for from 15 to 20 bushels per acre. The corn was also much improved by the guano, but to what extent I am as yet unable to determine, as I have not yet gathered it—but am satisfied it will pay well for the expenditure. With proper management and a moderate expense, I have no hesitation in saying our lands generally can be made as productive as any lands on the Atlantic slope; and for beauty of scenery they are not surpassed from Maine to Texas. Sufficiently undulating to carry off redundant water, beautifully diversified by hill and dale, and plentifully supplied by the very best springs of water the world can afford—the largest streams affording constant and ample supplies of water for milling and manufacturing purposes; and, with the exception of a few situations on the borders of our rivers, *healthy*, almost to a fault, as our physicians would say. The timber generally, except on the margin of the streams and in the valleys, is young and thrifty, consisting of every variety of oak, hickory and poplar, interspersed on the ridges with chestnut. I located myself here in the year 1812, at the commencement of the late War with England, and about that time, in a conversation with an old gentleman (84 years old) who was born on one of the plantations I purchased, he told me that *his father was the only white man then settled between the Eastern Branch (at Washington City) and the new settlement at (now) Frederick City*—that the only road between those places was an Indian trail that crossed the Seneca immediately above my factory and mills, and that the country when he was a boy, except the valleys, was covered by a low growth of bushes, over the tops of which he could see the deer bounding for a long distance, whenever they were started. This accounts for the present timber being young and not very large, except in the valleys, where it is found in many of them very large and of the very best quality, particularly white-oaks that are hard to beat in any country. Since that period the country has been occupied and is still occupied in part by the proprietors of the soil; but besides them there was a class of tenants on large tracts of land held by non-residents, whose sole object was to obtain all they could from the soil, cutting down, clearing and cultivating it in such a manner as to obtain all they could from it, and when it would no longer yield them a profit on their labor, deserting it for other new regions, and leaving it exhausted and unoccupied, and finally turned out into what is termed old fields. Those old fields, however, in many instances, are filling up and becoming covered with a growth of pine which in a few years gives a new character to the soil, and when cleared is very productive, and by judicious treatment can be rendered permanently so, by the proper use of clover, plastering and rest. The inhabitants generally are very hospitable, peaceable, and (becoming) industrious in their habits, and have a desire to improve their condition. In this respect there has been a most wonderful change within the last ten or twenty years, and is still on the increase—of which you may form some idea when I inform you that I have understood from reliable authority that of the article of guano alone there have been used nearly or quite 500 tons in this county the present year. Now is the time for purchasers to procure lands in this country (before their value is more fully demonstrated or known), while they can be purchased for a song, and will fully repay the investment in a year or two, by the application of those imported manures and the use of such materials as the lands themselves afford. I should think the opportunity a favorable one for establishing the *young scions* of some of your wealthy citizens to advantage, where they might be pleasantly located near the Capital of the Union, and by proper attention to their new vocation become useful and respectable citizens, and infinitely more happy than in the pursuits of fluctuating and precarious mercantile operations and trade. Our young ladies are intelligent and fascinating, and make the best of housewives; and as for the comforts and many of the luxuries of life, they are to be procured here in abundance, including, as you justly observe, the best bacon in the United States.

Your ob't serv't. FRANCIS C. CLOPPER.

PRACTICAL NOTES,

FOUNDED ON OR DRAWN FROM AGRICULTURAL READINGS—BY THE EDITOR.

At Farming-Clubs in England, instead of wasting their time and breath about this thing and that thing, and everything, they stick to a given theme until it is sufficiently elucidated and exhausted to enable them, as they think, to come to some practical result. That result is embodied in a Resolution which is put in form, passed upon and sent out as the best judgment of the Club, for what it is worth, to have its weight according to the known judgment and practical knowledge of the members. The subjects are always of substantial importance connected with the field operations of practical men. Thus at a late meeting of the Spalding Club, "after an able and interesting discussion" by farmers whose names are given, the following Resolution was unanimously adopted:

"That with regard to feeding sheep it is highly desirable to give them a change of food, which will keep them in a more healthy state than confining them to one sort of keeping. With respect to beasts, *if not intended for grazing the ensuing summer*, they cannot be kept too warm, if attention is at the same time paid to proper ventilation; and that a variety of food, such as Swedes, mangel-wurzel, cake, and clover, will be found most fattening; beasts intended for grazing should not be housed or kept too warm."

The "feeding" sheep here spoken of we apprehend means feeding in the process of fattening; but what seems most worthy of remark is the distinction taken between beasts to be *fattened* and beasts to be grazed the next year—that while the former "cannot be kept *too warm*, if attention is paid to proper ventilation," the latter "should not be housed or kept too warm."

By another Club it was resolved, without one dissent,

"That the trough system with cut hay, turnips, &c., was every way preferable to the old cage practice, which invariably leaves seeds and scattered turnips half consumed all over the fold; and that it is the best management to keep ewes well at all times, in order to insure healthy and well-grown lambs." [This corresponds with the practice of our friends in the grazing districts of Western Virginia.]

A gentleman exhibited a plan for "field-shed feeding," formed of hurdles and thatched, put together at a small expense, and movable as the food is consumed, by the shepherd and his assistant, which was highly commended, and will no doubt come into general use when the inclement weather sets in; as there is no doubt one acre of turnips will produce *much more mutton when consumed in warm sheds than when fed in the open ground.*

We believe the Messrs. Reybold, of Delaware, who unite reflection with experience, breed their sheep under warm shelters through the winter.

Long-Wooled Sheep in England.—At a late public sale, a splendid lot of long-wool shearling rams (40 in number) was sold by auction by Mr. Briggs, bred by and the property of Mr. Thomas Mons, of Stenigot, near Lowth. They were thought by many eminent judges to be the best lot of shearlings, for their number, that had been offered at Lincoln on any prior occasion. After a very spirited sale the whole were sold at an average of near £10 each, and a few of the best averaged £20 each; a pair of twin sheep, much admired, sold for £36 ($5 to the pound).

A Hint to those who waste Manure.—A little book "On Manures," recently published in French, concludes with the following sensible maxim: "The scarcity of manures is the cause of the sterility of a country, and it is useless to improve the mechanical methods of culture if we neglect this source of fertility." In Flanders it is commonly believed that the first crop exhausts one-half of the manure. [*Comptes rendu a l'Academie.*

HOVEN OR BLASTING IN SHEEP AND CATTLE.—A late Mark-Lane Express has the following:

Lord Portman is desirous of making known the following simple remedy for hoven or blasting in cattle. It is taken from Johnston's Agricultural Chemistry: "Give two or three table-spoonsfull of liquid ammonia (*i. e.* hartshorn) diluted with water, as soon as the animal shows any symptoms of the disorder, and drive it off the field where the attack has been produced. The quantity of water must depend on the strength of the hartshorn. A bottle of hartshorn should always be at hand where sheep are feeding on rape, &c., as deaths follow very rapidly when this disorder is unchecked. The swelling is due to fermentation in the stomach, and the consequent formation of carbonic acid, and some hydro-sulphuric acid gas—with both of these ammonia combines, and puts an end to fermentation."

WHAT HAS BEEN DONE CAN BE DONE AGAIN.—The object in going back to see what has been done, is to bring us to the resolution of *excelling* in that which is good. When Agricultural Societies offer premiums for large crops, as such merely, they ought at least to require that they should exceed what their award lists already show what has been done. We find the following in a late number of the Mark-Lane Express. Multiply the *quarters* by 8, and it will be found that 60, 70, and even upward of 80 bushels of wheat on an acre may be made:

Faversham.—So bountiful have been the crops of wheat in this neighborhood from the late harvest, that in many instances as much as 8 quarters an acre have been reaped; and the respected vicar, Rev. Mr. Collins, in a very eloquent discourse on Sunday se'nnight, stated that as much as 10 quarters of wheat had been grown on a single acre of land, and 14 quarters of barley on a like portion. That the above are not solitary instances may be known by the fact that on a single acre selected from a field of wheat on the farm of Mr. Collard, of Reculver, 10 quarters and 3 bushels was the amazing produce, which was proved with great care for the purpose of deciding a considerable wager. [Kentish Observer.

AGRICULTURAL CLUBS—THEIR UTILITY.—To how many counties besides the one for which it was issued, would not the following Prospectus apply?

"At a time like the present, when the necessity for increased knowledge, industry, and economy is urged upon the Maryland farmer by so many considerations, which not merely involve the question of his continuing to enjoy undiminished the comforts to which he has hitherto been accustomed, but which plainly prove that he cannot maintain anything like his former position unless by adopting a better system of farming, by which he can so increase the productive powers of his land as to be able to meet the increased demands upon him and the increased competition against him; and when we take into consideration the power of association and the strength derived from union, it cannot escape the notice of sensible men both how much this district wants, and how greatly it is likely to be benefited by, a Farmers' Club."

TO MAKE A EWE ADOPT A STRANGE LAMB—DETERIORATION OF DOMESTIC ANIMALS IN AMERICA.—The usual practice is, when a ewe loses her lamb, to place its skin on the lamb which it is desired she shall nurse in place of it. This is usually attended with success, but, says the author of a Prize Essay on Sheep, in case of difficulty, a little gin rubbed upon the skin of the lamb [meaning, it is presumed, the skin of the lamb to be foisted on her in place of her own] and nose of the ewe, at once effects the desired object. This expedient is so easily adopted that it was thought best to give it a place in The Farmers' Library. We take the occasion to say that we believe American Farmers generally have no idea of the great and unwearied care taken in England by breeders of improved stock of every sort, to keep it up to the mark of highest excellence. Those who are aware of it cease to wonder at the deterioration which generally ensues after a few generations in this country, with stock from high-priced imported ancestors. We have not the practiced skill in breeding nor the latitude of choice which are necessary for the selection of breeders.

An ox that is in good condition in the spring, will perform more labor, and stand the heat of summer much better than one that is poor.

THE HOUSEWIFE'S DEPARTMENT.

In our last, gentle readers, we gave a little more space to this Department than can be promised for it generally; and return to it now with a sense of our inability to sustain it in a manner worthy of the obligation it implies; for what trust in the circle of social duties can be more imposing and responsible than that of undertaking to share in offering advice, and providing appropriate intellectual food for the minds of daughters who aim to be the pride and consolation of their parents; and for mothers on whose example and virtues the happiness and prosperity of their families depend—mothers who shall merit to have it said of them: "Her children rise up and call her blessed, her husband also, and he praiseth her."

One perplexity in the management of this interesting department is in considering what is adapted to the position and duties of housewives, differing so much as they do—according to difference in the social habits and domestic economy of different parts of our country. Our own observation in early life has made us most familiar with, and anxious about the lot of Woman as she is placed *in the country*, acting the most engaging part of the domestic circle of well bred, well informed gentlemen farmers and planters, as they are found in that middling and moderate condition as to fortune and circumstances in life, which, in the main, seems to offer the best chance for such true independence, respectability and happiness as may be reasonably hoped for in our country. It is to them that we shall generally address what we may have to store away in this corner of the Farmers' Library, in the hope that even though we may fail to benefit by wise counsels, we may yet propitiate their good will by the manifestation of our own. Trite as the saying may be, it is no less true, that regard for the feelings of Woman and the melioration of her condition has kept pace with advancing civilization, yet in no country has she received her full measure of consideration and respect, when we reflect that in full proportion to the progress of civilization her duties become more elevated and her responsibilities enhanced. With some opportunities to judge, both in town and country, the first remark we have to make is, that while the public sentiment is evidently improving on that point, the *education of females* is yet, too generally, either grossly neglected or egregiously mismanaged, with reference to the arduous and delicate station which every young woman is expected to occupy ultimately, and earlier in ours than in any other country in the world. Not that they come to maturity so soon as in some others, but that the means of independent support are so much more abundant or more easily acquired. Where every member of a family is brought up to labor, parents are too apt to calculate the money value of their children's time, and thus never being educated up to that point which begets a fondness for reading, for the sake of intellectual acquirement and recreation, they are not only cut off, in after life, from a cheap resource, that might enable them to fill up many an idle and dangerous moment, and to beguile many a sad one; but are also disqualified to perform that highest office of a noble mother—*the instruction of her offspring*. On the other hand, where the means and even the will exists to bestow a liberal education, it is too apt to be so often perverted in the conduct of it as to qual-

ify them for catching frivolous admirers, rather than for making good house wives and well-qualified mothers.

Entertaining these impressions, founded on no very limited observation, you behold, gentle readers, the motives which will prompt us, and, as says the conveyancer, "be it known to all whom it may concern," to endeavor with what success we may, so to conduct this, *your* department, as to mingle amusement with instruction—instruction in other things besides cake and jumble making. It is in the way thus indicated, by leading the housewife to understand that her duties, when properly understood and appreciated, are as highly intellectual and morally responsible as those of her husband—that there is a principle and a literature that belongs as much to the manufacture of butter and the cultivation of the vine, as to any of his pursuits—that she can be brought to feel and to assert the dignity of her position, and prepared to exchange the pleasures of intellectual intercourse with her husband at the same time that she acquires confidence and capacity to rival him in his outdoor management, and even to take that on herself in case of his sickness or indispensable absence—too often at a cross-roads militia mustering or partisan slang-whanging. Sorry are we here to say, as truth requires, that an ill-judged, not to say cruel economy, too often leads husbands to withhold from the wife the assistance indispensable to the comfortable and successful management of the duties assigned her, and this want of the requisite aid and convenience, be it said, is much more remarkable in the country, where the housewife's duties are more complex, and the sphere of them much more extensive than in town; and herein may be recognized another of the numerous and powerful attractions ever drawing people from the country to the cities. Not long since, we remember, on a visit to a Lunatic Asylum, in a northern city, renowned, justly, for the humanity of its discipline and the economy and success of its administration, we inquired of the accomplished physician in charge of it, from what particular class of society came the largest proportion of his patients; and the painfulness of his reply will never be forgotten, could we live to the age of Methuselah: "They come," said he, "from the class of young married women, after their second and third child." Often, added he, their husbands, eager for the pittance of gain, not satisfied with devolving on them the toils and care of their own household and family proper, take in boarders besides, who work in the neighboring factories, and for whom also the wife has to cook, and otherwise labor—and thus, between child-bearing, nursing, and accumulated drudgery and anxieties, their minds break, even before their constitutions, and the poor woman, who but a few short years before had resigned father and mother, and sisters and brothers, to cling unto him who promised to love and to cherish her, becomes the victim of a niggardly economy, and is lodged as a maniac in a lunatic asylum, leaving her poor children to struggle with a destiny, if possible, more perilous and sad than her own. True, in that asylum, as at Baltimore, under the unfailing and enlightened benevolence of a Stuart, the patients are felt and cared for, as all should be who are thus bereft of that greatest boon of the Almighty power—*their reasoning faculties*. But alas, what can "minister to a mind diseased?"

We cannot close this, as we fear it has appeared a rather tedious homily on the condition and cares of the housewife in the country, without a word on that word so much misunderstood—*education!* In the general if not literal application, it is understood to be that portion of knowledge acquired within the walls of a school-house, under the instruction too often of rude and ignorant peda-

gogues; because, in our country, the noble office of instructor is so badly paid and so little respected. But in the true sense of the word education—in the light in which it is especially incumbent on every parent to view it—all Nature is but one great school-house, and every sense a teacher. Yet above all places, the moral influence exists at home—at the fireside—in the examples and the conversation of parents. What emanates from them, is received with implicit confidence, and carries with it the force of truthful authority. Hence the wisdom of Solomon's injunction, "train up a child in the way he should go, and when he is old he will not depart from it." Neglecting this injunction the consequence follows, that "He visits the iniquity of the fathers upon the children to the third and fourth generation"—for there is no knowing through how many generations a false principle in morals or vicious example may go down. There is no limit in fact to the power of education. It makes the bear dance. While of all the blessings that Providence can bestow or education improve, none can exceed that of a *cheerful temper*. Of such an one, Hope is ever the inseparable companion, ready to throw a ray of sunshine over the most sombre pictures of life, to mitigate adversity, and to make prosperity doubly prosperous. It may be that this is the gift of Nature, but all her gifts are improvable, and invite the exercise of reason and judgment. As plants, not indigenous, have been made by the art and diligence of the horticulturist to flourish in soils not their own, so in the youthful mind and bosom the parent may plant the seeds, not only of resignation, but of contentment and cheerfulness under the sorest afflictions, the visitations of poverty and disease, and the loss of our dearest relatives. As a moral may be drawn from almost everything around us, let us point you, fair readers, to the example of your own little canary—a hopeless prisoner for life! Yet admire his vivacity, and listen, how he beguiles his endless confinement with his various but endless song. As the great naturalist Buffon has said of him—"The Nightingale is the chantress of the woods, the Canary is the musician of the chamber. Its education is easy; we rear it with pleasure because we are able to instruct it. It leaves the melody of its own natural note, to listen to the melody of our voices and instruments. It applauds, it accompanies us and repays the pleasure it receives with interest. It sings at all seasons, cheers us in the dullest weather, and adds to our happiness, by amusing the young and delighting the recluse, charming the tediousness of the cloister, and gladdening the soul of the innocent and captive." What an example is here set by one of the least and most engaging of the feathered creation! And how often have all of us seen gayety and innocence thus combined in one or more lively and amiable members of a family, the 'life and soul,' as they are called, of the house in which they dwell! Such a temper is to be valued, as it gladdens its possessor and all around, beyond all price. The mines of Golconda contain nothing so precious. It deserves the name bestowed on a new plant in Europe, called the "gold of pleasure."

But, fair readers, it is time to look for something of what is now days called practical, lest he whose judgment is always to be consulted should say "well, in all this, what has he told you that is useful for the housewife, in her chicken bonnet and apron, with her bunch or basket of keys in her hand?" True enough, so let us turn to our *receipt book*. Not one stereotyped and printed by steam and for sale by the thousand, and whose merit consists in the exactness of its alphabetical arrangement and the size of its volume; but one of your real honest manuscript treasures, containing the very essence and quintessence, the quinine of good housewifery, as it is practiced in the good Old Thirteen, where ladies

are not ashamed to look after the churning of the butter and the feeding of the poultry—where they still carry their own keys and give out the flour and the butter and the sugar and the coffee—where they *know* the exact proportion of plums for a pudding, and sage to sausage-meat. Those are the sort of receipts we can trust, and, ladies, if in any one we ever deceive you, all we have to say is—send us a better. So now for—let us see—ah! this is the very season

To Make Buckwheat Cakes.—Instead of yeast, not everywhere to be conveniently had, you may use carbonate of soda and tartaric acid, after this fashion. To 3 pints of buckwheat flour mixed into a batter, add one tea-spoonfull of carbonate of soda dissolved in water—add one also of tartaric acid dissolved in like manner. These you can get at any of the druggists when you send to town. First apply the carbonate, stir the batter well, and then put in the acid. Thus the use of yeast is entirely superseded, and cakes as "light as a feather" are insured. One great advantage is, that the batter is ready for baking as soon as it is made.

N. B.—As buckwheat cakes are sometimes met with, made of black meal and not lightened, and then burnt without being done, one might as well eat so much raw hide. We used to send to Philadelphia, and get meal nearly as white as wheat meal. S.

Receipt for Making Journey or "Johnny Cake."—Boil a quart of milk, and stir into it one quart of Indian meal, from corn grown south of the Chesapeake—Northern corn is not light and dry enough, any more than Northern wheat, to make the best bread, though it may be, and probably is, more nutritious for horses—add a little salt and a piece of butter or lard the size of an egg. Spread the dough on the Johnny-cake board half an inch thick—some bake it in pans, but they are not of the school in which people know "what's what." It should be an oak board, such as used for shingles, about 18 inches long, kept as clean, by scraping and washing, as clean can be—as clean as ladies' fingers. The board must be wet when the dough is put on, to be spread and patted to the proper thickness, and laid lengthwise on the hearth, near enough to the fire to cook quickly without burning, and when done brown, without being burnt on one side, the kitchen knife is passed from end to end under the cake, when it is turned, and returned to its place at the fire—[we like to be precise in these cases]—and as *soon as done* it should be eaten, while hot, with *good* butter. *Mem.*—Some, for economy, put aside butter that is *not* good, and call it "*cooking butter.*" Well, if not for cooking, for what purpose *should* butter be good? All butter is good or not good, and that which is not good should be at once consigned to the slush-tub, or have a little tar mixed with it and laid aside for the *cart-wheels!* But good Johnny-cake, as well as a good many other good things, are only to be had where there are—*wood fires.* S.

Postscript.—Dear Ladies, let me detain you while I make one extract from a book on my table entitled, Fruits and Farinacea.

Sir William Temple, after noticing the customs and habits of the Patriarchs, says, [and we believe it,] "From all these examples and customs it may probably be concluded that the common ingredients of health and long life are, great temperance, open air, easy labor, little care, *simplicity of diet*—rather fruits and plants than flesh (which corrupts the humors,) and water, which preserves the radical moisture without too much increasing the radical heat." "A quiet state of mind is of the utmost importance to the maintenance of health, and a light and spare diet contributes greatly to the same end."

No one, no, not even the doctor, has more right or reason to be instructed in the rules of *Hygeia* than *mothers*. Hygeia, you know, was the "sweet smiling Goddess of Health," and is figured, in painting and statuary, with a bowl in her hand from which a serpent is eating—emblematic of the art of Medicine. There is a marble figure of Hygeia surmounting that glorious fountain of health, the old White Sulphur Springs, in Greenbriar, Virginia.

S.

Eggs and Poultry.—Among all nations, and throughout all grades of society, eggs have been considered a favorite food. But in our cities, and particularly in winter, they are sold at such prices that few families could afford to use them at all, and even those in easy circumstances consider them too expensive for common use. There is no need of this. Every family, or nearly every family, can, with very little trouble, have eggs plenty during the year, and of all the animals domesticated for the use of Man, the common dunghill fowl is capable of yielding the greatest profit to the owner. In the month of November, I put apart eleven hens and a cock, gave them a small chamber in the woodhouse, defended from storm, with an opening to the south. Then food, water and lime were placed on shelves convenient for them, with nests and chalk nest-eggs in plenty. These hens continued to lay eggs throughout the winter. From these eleven hens I received an average of six eggs daily during the winter; and whenever any one of them was disposed to sit, namely, as soon as she began to cluck, she was separated from the others by a grated partition and her apartment darkened. These cluckers were well attended to and well fed. They could see and partly associate through the grates with the other fowls, and as soon as any of these prisoners began to sing, she was liberated, and would very soon lay eggs. It is a pleasant thing to feed and tend a bevy of laying hens. They may be tamed so as to follow the children, and will lay in a box. Egg-shells contain lime, and when in winter the earth is covered with frost and snow, if lime be not provided for them, they will not lay; or if they do, the eggs of necessity must be without shells. Old rubbish lime, from chimneys and old buildings, is proper for them and need only to be broken. They will often attempt to swallow pieces of limo and plaster as large as walnuts. The singing hen will certainly lay eggs if she finds all things agreeable to her, but the hen is so much a prude—as watchful as a weasel and fastidious as a hypocrite—she must, she will have, secrecy and mystery about her nest. All eyes but her own must be averted. Follow or watch her, and she will forsake her nest and stop laying. She is best pleased with a box covered at the top, with a back side aperture for light, and a side door by which she can escape unseen. A farmer may keep one hundred fowls in the barn, may suffer them to trample on and destroy his mows of grain, and have fewer eggs than the cottager who keeps a dozen, provides secret nests, chalk eggs, pounded bricks, plenty of corn or other grain, water and gravel for them, and takes care that his hens be not disturbed about their nest. Three chalk eggs in a nest are better than one, and large eggs please them most. I have smiled to see them fondle round and lay in a nest of geese eggs. Pullets will begin to lay early in life, when nests and eggs are plenty, and when others are clucking around them. A dozen dunghill fowls shut up from the means of obtaining food, will require something more than a quart of corn a day. I think fifteen bushels a year a fair allowance for them; but, more or less, let them always have enough by them; and after they have become habituated to find at all times plenty in their little manger, they take but a few kernels at a time, except just before going to roost, when they will take nearly a spoonfull in their crops. But just so sure as their provisions come to them scanted or irregularly, so sure will they raven up a whole cropfull at a time and stop laying. A dozen hens well attended, will furnish a family with more than two thousand eggs a year, and one hundred full grown chickens for the fall and winter stores. The expense of feeding a dozen fowls will not amount to more than eighteen bushels of grain. They may be kept in cities as well as in the country—will do as well shut up the year round as to run at large. A grated room well lighted, ten feet by five, partitioned from a stable or other outhouse, is sufficient for a dozen fowls with their roosting, nests, and feeding-troughs. In the spring of the year, five or six hens will hatch at a time, and the fifty or sixty chickens may be given to one hen. Two hens will take care of one hundred chickens well enough until they begin to climb their little stick roosts. They then should be separated from the hens entirely. I have often kept the chickens when young in my garden. They keep the May-bugs and other insects from the vines. In case of confining fowls in summer, it should be remembered that a ground floor should be chosen; or it would be just as well to set in their pens boxes of well dried, pulverized earth, for them to wallow in during warm weather. Their pens should be kept clean. [Scottish Reformer's Gazette.

Hints to Lovers of Flowers.—A most beautiful and easily attained show of evergreens in winter may be had by a very simple plan, which has been found to answer remarkably well on a small scale. If geranium branches are taken from healthy and luxurious trees just before the winter sets in, cut as for slips, and immersed in soap and water, they will, after drooping for a few days, shed their leaves, put forth fresh ones, and continue in the finest vigor all the winter. By placing a number of bottles thus filled in flower-baskets, with moss to conceal the bottles, a show of evergreens is easily procured for a whole season. They require no fresh water.

Seedling Fruit.—It is gross ignorance, says Professor Lindley, in any man to suppose that the seedlings of grafted plants will be the same as the parent.

HORTICULTURAL ZEAL.—Some idea may be formed of the spirit which animates Horticulturists in London, from the fact that some time since Dr. LINDLEY offered three prizes of 10s. 6s. and 4s. for the three *most extensive* and *best named* collection of Wild Flowering Plants, gathered between 6 P. M. on July 31, and 6 A. M. Aug. 2. These prizes were contended for by the following persons, viz.:

CULVERWELL,	producing	176	species,	of which 168	were allowed.
BAXTER,	"	173	"	166	"
SHERWOOD,	"	166	"	158	"
DUMBRILL,	"	123	"	121	"
WILLIAMS,	"	123	"	120	"
COLMER,	"	120	"	118	"
HADLOW,	"	100	"	93	"

and consequently the first three competitors gained the prizes.

We have been forcibly attracted by the number of beautiful wild flowers that adorn the banks of the Alabama River in early spring.

Young ladies who have the good fortune to become farmers' wives will find it more profitable to know how to make Johnny-cake, butter and cheese, than to play the piano, though there is "a time for all things."

PRICES CURRENT.

[*Corrected, December 22, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47	℔ 100 lb.	5 50	@— —
Pearls, 1st sort, '47		7 —	@— —
BEESWAX—American Yellow		— 22	@— 22½
CANDLES—Mould, Tallow	℔ lb.	— 12	@— 14
Sperm		— 31	@— 38
COTTON—From	℔ lb.	— 6½	@— 9¼
COTTON BAGGING—Kentucky		— 15½	@— 16
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 9
Sheetings		— 6	@— 15
FEATHERS—American, live		— 35	@— 37½
FLAX—American		— 8½	@— 9
FLOUR & MEAL—Genesee, new, bbl.		6 37½	@ 6 50
Oswego		6 06½	@ 6 12½
Michigan		6 18¾	@ 6 25
Ohio		6 18¾	@ 6 25
Ohio, Round Hoop		— —	@— —
Ohio, via New-Orleans		— —	@— —
Pennsylvania		— —	@— —
Brandywine		6 75	@— —
Georgetown		— —	@— —
Baltimore, Howard-street		— —	@ 6 50
Richmond City Mills		— —	@ 7 50
Richmond Country		— —	@ —
Petersburg		— —	@ 6 50
Rye Flour		4 37½	@ 4 50
Corn Meal, Western and State		3 18¾	@ 3 37½
Corn Meal, Pennsylvania & Jersey		3 37½	@ 3 50
GRAIN—Wheat, White	℔ bush.	1 35	@ 1 40
Wheat, Red and mixed		1 25	@ 1 32½
Rye, Northern		— 85	@— 85
Corn, Jersey and Northern yel		— 80	@— 81
Corn, Southern, yellow		— —	@— —
Corn, Western, yellow		— 77	@— 79
Oats, Northern		— 47	@— 51
Oats, Southern		— 42	@— 45
HAY—North River in bales,	℔ 100 lb	— 54	@— 60
HEMP—American, dew-rotted	ton	120	@140 —
" " water-rotted		160	@190 —
HOPS—1847		— 6	@— 7½
IRON—American Pig, No 1		37 50	@40 —
" Common		30 —	@32 50
LIME—Thomaston	℔ bbl.	— —	@— 80
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35 —	@ 40—
Boards, Eastern Pine		— —	@— —
Boards, Albany Pine	℔ pce.	— 10	@— 19
Plank, Georgia Y. Pine.	℔ M. ft	27 50	@30 —

Staves, White Oak, pipe.	℔ M.	60 —	@— —
Staves, White Oak, hhd		45 —	@— —
Staves, White Oak, bbl		35 —	@— —
Staves, Red Oak, hhd		30 —	@33 —
Hoops		27 —	@32 —
Scantling, Eastern		17 50	@20 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 22	@— 25
Timber, White Pine		— 18	@— 22
Timber, Georgia Yellow Pine		— 30	@— 35
Shingles	℔ bunch	2 50	@ 2 75
Shingles, Cedar, 3 feet, 1st quality		28 —	@34 —
Shingles, Cedar, 3 feet, 2d quality		27 —	@32 50
Shingles, Cedar, 2 feet, 1st quality		20 —	@25 —
Shingles, Cedar, 2 feet, 2d quality		18 —	@22 —
Shingles, Cypress, 2 feet		18 —	@22 —
Shingles, Company		35 —	@38 —
MUSTARD—American		— —	@— —
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 14
Cut 4d to 40d		— 4½	@— 4½
PLASTER PARIS—℔ ton		2 75	@— —
PROVISIONS—Beef, Mess,	℔ bbl.	8 25	@ 8 75
Beef, Prime,		5 25	@ 5 75
Pork, Mess, Ohio		— —	@— —
Pork, Prime, Ohio		8 —	@ 8 12½
Lard, Ohio	℔ lb.	— 6¾	@— 8½
Hams, Smoked		— 9½	@— 11½
Shoulders, Pickled		— 5½	@— 6
Beef Hams in Pickle		— 8	@10 —
Beef, Smoked	℔ lb.	— 6	@— 6½
Butter, Orange County Dairy		— 19	@— 21
Butter, Western Dairy		— 14	@— 16
Butter, Grease		— —	@— —
Cheese		— 6	@— 7
SEEDS—Clover	℔ lb.	— 7	@— 7½
Timothy	℔ tierce	15 —	@17 —
Flax, Rough		— —	@— —
SOAP—New-York	℔ lb.	— 4	@— 7
TALLOW—American Rendered		— 8	@— 8½
TOBACCO—Virginia	@ lb.	— 2¾	@— 7½
North Carolina		— —	@— —
Kentucky and Missouri		— 4	@— 7½
WOOL—Am. Saxony, Fleece,	℔ lb.	— 45	@— 50
American Full Blood Merino		— 38	@— 40
American ½ and ¾ Merino		— 33	@— 36
American Native and ¼ Merino		— 28	@— 30
Superfine, Pulled Country		— 33	@— 35

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THE TOBACCO WORM AND FLY:

FARTHER REMARKS ON THEIR NATURAL HISTORY AND HABITS.

The following letter was prefaced with apologies, altogether unnecessary, as the reader will perceive, for the writer's want of habit and experience in writing for the Press. As often happens with such apologies from such writers, they are followed by exactly that sort of plain-as-a-pike-staff sort of statement which is at once most intelligible and most pleasing to every reader who likes to throw aside the shell and come at once to the kernel of the matter. This letter from Mr. Dorsett, as well as those lately received from Mr. Bowie and Mr. James Owens, Jr., on the subject of Tobacco—Mr. Caperton on *Grazing*, and Doctor Williamson on *Fattening Cattle*—all of which occur to us at the moment—as well as many others that might be designated, besides the information they convey, go to convince us how much knowledge, more than is usually supposed, is locked up, as it were, in the experience and the minds of the plainest practical farmers and planters, confined to themselves, or at most communicated orally to their immediate neighbors, and which ought to be universally disseminated for common benefit.

In regard to the habits of these pestiferous insects, we confess that we did not expect, when we commenced the inquiry, that so much observation had been made; and even though its promulgation should lead to no practical preventives against their ravages, at the moment, the facts related are not the less honorable to the "habits" and the character of the observers; inasmuch as they show that Agriculture has *some followers* who pursue it as an interesting and intellectual avocation, opening various fields for amusing as well as useful researches. How much in real merit above the horse that he rides, or the ox that he drives, is the drone whose only ambition is to count the *money* results of all his operations—esteeming and treating the business to which his children are to devote their lives as a mere beastly, mindless drudgery? Instead of which, what industry, it may be demanded, under Heaven, offers so many opportunities for the exercise of benevolence—so many curious subjects of examination—such hopeful ground for improvement? Why, reader! it has been but a few years since the agricultural world was presented, through the agency of the "*Society for the Diffusion of Useful Knowledge*," (one of the most praiseworthy and useful associations to which any period of the world has given birth)—it has been but a few years

since, under their auspices, the "Farmers' Series" of their publications was issued, embracing the latest improvements—what might be deemed the sum of agricultural knowledge at *that time*—and yet already a *supplemental* volume has just been published at their instance by Professor Johnston, to give more recent discoveries and observations; and these discoveries and improvements are found to be yet more valuable and important than any which had previously been made known. We mention it only to show how progressive is the course of agricultural melioration, and how, as we rise in this pursuit, as in others, in the knowledge of discoveries already made, the prospect opens far and wide on all sides, for yet greater ameliorations, to stimulate industry and keep honorable ambition alive. But, introductory to the following letters, let us take room to put to the reader one or two simple questions: Have you children—sons or *daughters*—who are to live and prosper in the world by the practice of Rural Industry? If yes—*are you taking the necessary measures to have them imbued with such knowledge and such tastes as will invest their every-day life and occupations with that interest which can only exist where there is room for amusing investigation, and the hope of profitable discovery?* Or do you mean that they shall delve on, through a toilsome, monotonous existence, their daily labor being associated in the mind with *nothing* but the gross amount of the *money its produce will command in the market!* If, for yourself and your children, you would give to every object in Nature some power to amuse and to invite intellectual speculation, and banish the *ennui* that afflicts and depresses the uncultivated mind, and drives its possessor to the rum-shop or the gaming-table, procure for yourself, and throw in their way the researches and experience of active-minded, laborious and philanthropic inquirers into the Natural History of animals and vegetables, the composition of soils and manures, the philosophy of cheese and butter making, the propagation and food of injurious insects, &c. Get your commission merchant to call on the booksellers—any of them will send you, without charge, a catalogue of his books. Subscribe, too, if you can, to circulating libraries. For a few dollars a year, you may have access to tens of thousands of volumes. Take the agricultural papers, of course. In *this* journal you will get the *cream* of what comes in *our* way, and we see all that is published in our own and most of that which appears in England and in France. Believe us, agriculturists, there is no occasion to go, for amusement or information, to branches of knowledge alien to your own situation and employments; for those which are immediately and collaterally connected with them are infinitely various and entertaining; and if you will give your children a chance to cultivate them, *when they are young*, and their habits yet being formed, they will go through life without—no, not without, but with one great, unceasing lamentation—*lamenting the want of time and faculties to look for and to learn, more and more.*

Well, good reader, little did you, and as little did we, expect to be led off upon such a digression, when we took pen in hand merely to express our own, and to bespeak your thanks for the information conveyed in the letters which follow from intelligent and obliging correspondents; yet we must ask you to bear with us while we transcribe a single passage, met with even since the preceding was written, in the conclusion of the Life of the celebrated circumnavigator, JAMES COOK, who "was born in a mud hut at Maston, in the North Riding of Yorkshire, 27th October, 1728. His father was an agricultural servant, who, with his wife, bore a most unexceptionable character for honesty and industry." The author of his interesting Biography closes it with some striking reflections,

which we cannot resist the inclination to copy, before we are called to breakfast. By-the-by, there is no sort of reading more useful for your sons, than the lives of men who, under difficulties, have attained eminence in their day. Many have been the men, such as Decatur and Porter, who have had their youthful ambition awakened, and been stimulated to deeds of daring enterprise, by reading the life and adventures of such men as Capt. Cook. But to the extract; if you have a son old enough to understand, with a spirit to feel the force of it, give it to him to "read *out*" to you, as they used to call it when my father used to make me read him one of Sterne's Letters to Maria, or some passages from Tristam Shandy, or whatever striking Essay on Agriculture happened at the time to appear in the newspapers, such as Taylor's "*Arator*" letters, that first appeared in a Georgetown newspaper.—"That man was never happy—happy upon reflection and while looking to the Past or the Future—who could not say to himself that he had made something of the faculties that God gave, and had not lived altogether without progression, like one of the inferior animals. We do not speak of mere wealth or station; these are comparatively nothing—are as often missed as attained even by those who best merit them—and do not of themselves constitute happiness, when they are possessed. But there must be some consciousness of an intellectual or moral progress, or there can be no satisfaction, no self-congratulation in reviewing what of life may be already gone, no hope in the prospect of what is yet to come. All men feel this, and all men feel it strongly; and if they could secure for themselves the source of happiness in question by a wish, would avail themselves of the privilege with sufficient alacrity. Nobody would pass his life in ignorance if knowledge were to be had by merely looking up to the clouds for it; it is the labor necessary for its acquirement that scares them; and this labor they have not resolution to encounter—yet it is, in truth, from the exertion by which it must be obtained, that knowledge derives at least half its value; for to this, entirely, we owe the sense of merit in ourselves which the acquisition brings along with it; and hence no little of the happiness of which we have just described its possession to be the source. Besides that, the labor itself soon becomes an enjoyment." This last remark is eminently true: the labor itself becomes an enjoyment, for there is constantly associated in the mind the idea of the enviable distinction that justly waits on superior knowledge, and the power which it so certainly confers, that the French have cast it into a motto—"*Le savoir est puissance*"—Knowledge is power. Let these observations meet with a ready reception among youth, says the writer, in whatever rank in life. Honor, and fame, and excellence are not to be achieved, even in farming, by merely wishing for them. It is only by an unwearied *striving after a new and nobler nature*—only by being useful to our fellows, and making the most of those qualities of mind which God has given us, that uncommon success and happiness are to be obtained in any path, or that we can fulfill the true ends of our existence as beings endowed by Providence with superior faculties.

Letter from W. N. Dorsett, *Esq., to* J. S. Skinner, *Editor of The Farmers' Library, on the Insects that attack the Tobacco Plant.*

December 20, 1847.

Dear Sir: Your favor of the 24th ult., to which I am about to attempt a reply, was not received, in consequence of my absence from home, until the 7th inst. I was again compelled to leave home for a week, which necessarily delayed my reply to the present time.

It is my opinion that at least one-fourth of the whole tobacco crop planted in

the year 1846 in Prince George's County was destroyed by the *Horn or Tobacco Worm.* They are produced by the horn or unicorn fly, as they are very appropriately called. This fly lays its eggs after sunset, chiefly on the under side of the leaf of the larger plants of tobacco, nearer the top than the bottom of the plant. They proceed very rapidly, darting from plant to plant, and usually lay but one egg on a leaf. They hatch in from four to eight days, and begin to eat as soon as hatched. At this period they may be easily found and destroyed, by a very small hole eaten through the plant. In a few days they rove about the leaf. When about one-fourth grown they crawl from one leaf to another, and when about two-thirds grown they descend the stalk, and in the heat of the day sometimes retire into the cool earth, under the lower leaves of the larger plants. They as frequently ascend another plant as the one from which they have descended. They, like the silk-worm, shed two or three times before they get their growth, and at each time cease to eat for several hours. They require from two to three weeks to arrive at maturity, soon after which they descend the plant and bury themselves in the field at various depths, from 4 inches to two feet deep. I am not aware that the tobacco worm surrounds himself with any kind of covering, as the silk-worm does. He remains in the earth, in the chrysalis state (having changed his color to a bright yellow) from autumn, exhibiting the impression of the wings and proboscis only, until the more genial season of the ensuing year enables him to fully change his character, when he appears above the ground, a busy, active insect, sipping honey from blossom to blossom. I have no idea how long they live after they have obeyed the great law of Nature in propagating their race. There are usually two gluts* of worms; the first glut appears about the last of June or first of July. The worms that mature and escape into the earth from this glut are supposed to produce a portion of the second glut. The second glut appears the last of August or first of September. This glut is much the most numerous and destructive, coming as they do when the tobacco is generally large and a portion of it ripe, and requiring all the force on the plantation to house it. The worms feed principally upon the ripe leaves, though they do eat the green top leaves, and even the suckers, which put out after the tobacco has been topped. Turkeys are very generally used as auxiliaries to destroy the worms; they, when not raised, are bought expressly for that purpose. When the tobacco is not too large, the worms from a fourth to half grown, and the turkeys large, they destroy them in immense numbers. When the tobacco is large and the worms nearly grown, the turkeys are not worth the trouble of keeping them in the tobacco-field. The great increase of the horn worm is ascribed in part to the fact that very few planters now fire their tobacco. Millions of the worms are carried to the house on the tobacco, and escape into the earth in and near the tobacco-house, and add incalculably to the number that had been left in the field. It is supposed that mild winters are favorable to the production of the tobacco fly, as well as to all the insect tribe. Upon this subject I confess I am somewhat skeptical. It is certain that a *scarcity* of the various insects is not *uniformly* the result of very hard winters. Of the fly that attacks the young plant in the bed there are, I believe, two kinds, or at least two sizes, and they of different forms and color. The larger kind I believe to be identical with the turnip fly. The smaller kind is extremely small, so small as not to be easily seen, except when in motion. Cold, dry, windy weather is most favorable to the ravages of the tobacco fly.

Many remedies have been tried, but none, I believe, with entire success. Pine brush spread over the bed immediately after it is sown, is a practice, in this and the adjoining counties, very generally adopted as a protection against the ravages of the fly. Whether the plant covered up and excluded from the sun is not palatable to the fly, is of course an unsettled question. The brush is taken off the bed as soon as the plants are large enough to be considered out of danger from the fly, and ought to be done in mild, moist weather.—Slaked ashes sown lightly over the bed when the dew is on, and freshly slaked lime sown in the same manner, have been recommended by some persons as remedies. Stable manure is used for the same purpose, which has at least this advantage. It is certainly a good top-dressing for the young plants, and protects

* The word glut, as here used, means the appearance of an immense number of worms at the same time.

them, in some measure, from the harsh, drying winds most propitious to the fly. It has frequently occurred to me that ashes well saturated with whale-oil soapsuds would be a good application, though I have never tried the experiment.

Very respectfully yours, &c. W. N. DORSETT.

We apprehend a sprinkling of the driest and finest dust of any kind, while the plant is yet wet with dew, would be the best preservative against the fly. If any fertilizer, such as trash tobacco, or poudrette, can be so thoroughly pulverized as to be used for that purpose, doubtless it would be better. How would charcoal dust answer? Guano is found to be too powerful when thus applied in direct contact with the plant; but Mr. Bowie's suggestion of a *solution* of it is feasible and promising. The worst of it is with agriculturists in these cases, they take it out in *having a great mind* to try this experiment and that. They think too long, and are too slow to *act*. Why don't Agricultural Societies stimulate to experiments out of the old beaten track?

GRAZING CATTLE IN WESTERN VIRGINIA.

Those who have enjoyed, as we had the pleasure to do last summer, an opportunity to contemplate this branch of Husbandry under peculiarly agreeable circumstances, cannot fail to regard it as one of the most pleasant and entertaining that can employ the capital and attention of the agriculturist. At the same time, it was impossible to see, without deep regret, a noble region of country like that of Western Virginia, with all its capabilities for the production of so many staples restricted, in the enjoyment of its rich resources, to this single product, resolving all its grass and its grain into *living locomotives*, as the only shape in which any profit can be derived from their fertile valleys and grass-clad mountains, their lime, timber, and water-power without limit. What a spectacle of improvidence, in this age of progress, to see a country so incumbered with timber as to cost the owner $10 an acre to get it cleared and burnt off, to make way for the plow, instead of having the cattle killed, and salted on the spot, the bark employed in tanning their hides, and the wood employed in burning the lime that cumbers the earth—instead of sending millions of pounds of lard, and tallow, and butter, and cheese, and flour, and pork, and honey, and hops, and wool, and iron, and salt, and a thousand things, to market by railroad, all these rich resources are either locked up altogether, or made to contribute only to the one interesting and beautiful but solitary pursuit of *grazing*. Oh! were it possible to enlist farmers as earnestly in the study and prosecution of their own interests, as they are made subservient to the schemes and the fortunes of politicians, and other more particular and closely banded classes of the community, what a glorious destiny one might see in the perspective, for States like Maryland and Virginia, the Carolinas and Georgia, with their inexhaustible materials and conveniences for every great agricultural staple, for mineral products of every kind, and for all the great branches of Manufacture! Blessed, in fact, with every natural guaranty of independence, prosperity and power, that God in all His goodness could confer on a favored people, and yet what a spectacle do we see! Confined to the cultivation of four or five staples, and dependent for a living profit on these upon the fluctuating policy of foreign Governments and the yet more uncertain prevalence of famine or abundance abroad, according

to the accidents of the seasons! Instead of rising in our might, as *one nation*, to demand the enactment of a policy that would force the capitalist with his capital, and the machinist with his machinery, to come and establish himself here, where materials and provisions are cheap, and where, with the fashioner of his produce in his immediate vicinity, the farmer and the planter would have demand for every production the earth could be made to bear, and would keep at home and save that portion of his labor, and products, and time, and manure, which are now wasted on the road and on the ocean, in the very act of exchanging his raw materials for manufactures at thousands of miles from each other.

But our purpose was merely to note as to one point touched upon in this interesting and valuable letter from Mr. Caperton. It will be seen that he adverts to the settled conviction existing among practical men of the intrinsic usefulness and value of *salt* in the practice of *grazing*.

The reason *we* raised the question was twofold—first, that if as useful and necessary as we there saw it was esteemed to be, the fact should be made known for the benefit, we will not say the confusion, of our friends in many parts of the country, who, as we well know, altogether neglect to have their domestic animals salted; and then another reason was that, as in Europe, where this work is read, the question of salt or no salt, in *fattening* cattle and sheep, has been lately raised, and careful experiments instituted to test it, we were desirous to have the benefit of the observations of practical men in our own country, most interested in the subject, and most likely to be well informed.

Adding now the testimony of Mr. Caperton to that of other gentlemen of observation, experienced graziers, we have only to say that according to the lately published results of actual experiments, made with great care and minuteness, in France and England, both with cattle and sheep, the use of salt proved to be of *no value whatever*. In the case of the trial with a dozen sheep, which lasted for several months, the salted sheep gained more than the unsalted by about one shilling's worth more than the *cost of the salt*.

The English experimenter, or Editor—we forget which—adverts to the same circumstance referred to by Mr. Caperton, the great fondness evinced by wild animals, in traveling to a great distance to *salt-licks*; still, he says, there is the obstinate fact, the undoubted result of a most exact and careful experiment.

After all, what a happy thing for the pursuit, that open questions are ever to be found that invite investigation and trial!

We are disposed to think that much may depend on locality. Both the soil and grasses are known to contain a certain amount of common salt; and the quantity may depend, among other circumstances, on the greater or less distance of the place from the ocean. We should doubt whether there exists, in Worcester County, on the seaboard of Maryland, anything like the same occasion to salt domestic animals that is found in Allegany County, and that independently of their cattle having access to salt water.

Since writing the above, we find in Johnston's Lectures on Agricultural Chemistry and Geology, a section on the very subject in hand, which we shall place immediately after Mr. Caperton's letter, and which contains perhaps all we can hope for, until we possess greater facilities for the application of Science to agricultural problems—such facilities as we now possess for its application to *warlike* studies and pursuits. With such facilities, it need not be long before we could have the grasses and the food grown on the seaboard analyzed and chemically compared with those on the mountains. So of the air, and the running

and rain waters of the two regions, and thus have settled on the basis of undeniable illustration, this and innumerable problems besides, interesting to Agriculture—one that if equally interesting to the purposes of war and manslaughter, would be *promptly investigated* by the Government, as was the *gunpowder cotton* question; and if the facilities had not been already provided for such analysis, for *military* uses, our *Congressmen* of both Houses, as recreant to the agricultural as they are subservient to the military class, would promptly and with one voice, on the first hint, supply the requisite facilities without a *question about the cost!* Such is the gross prostitution of legislative power over the treasure collected chiefly from the agriculturists, perpetrated by those whom, in their blindness and tame submission to abuse, they allow to *represent* them! Will the time ever arrive when generations described as having "eyes, but who saw not, ears but heard not, and understandings but understood not," shall pass away, and give place to those who will exercise for their *own good* the senses and faculties with which God has endowed them?

We ought to apologize to Mr. Caperton for using, as we here do, what was not "penned for publication"; but the subject is a novel one to many of our readers, who are as ignorant as we once were of how things are carried on up there in the gorges of the mountains, through which we see these fine droves of fat cattle come annually, rolling along down our turnpike roads, from far-off regions—a sort of *terra incognita* to us of the salt-water country.

Mr. JOHN S. SKINNER: OAKLAND, November, 1847.

My residence is in the south end of our county, about 20 miles from the Court-House, on a farm of about 1,240 acres, about 500 of which are cleared, the residue in woods—in its general features and character but slightly different from the lands in the vicinity of Union. I do not cultivate largely, nor to a greater extent than is sufficient to furnish grain, &c., for my own consumption, grazing being the business upon which I rely for a return. Besides the stock necessary for the purposes of the farm, I winter and graze 100 head of cattle, the ordinary cost of which, or rather the average of which one year with another, is about $14 50 to $15, which we are generally able to sell to purchasers for the Eastern markets for from $25 to $28. The business of farming and grazing thus combined I regard as the most beautiful imaginable. To take care of a hundred cattle, as we manage it in this country, so far as the labor and trouble are concerned, is, to use a common expression, a mere nothing. The only trouble or labor attending the matter is during the winter months, when it is necessary to feed them, to do which requires a man and a boy for a short time each day, using for the purpose a two-horse wagon—one driving while the other throws off the hay, fodder, or straw, on either side. We aim always to feed the straw when the snow is on the ground, inasmuch as the cattle eat it much better than at any other time. It is also better to feed Indian corn fodder on snow, for the reason that they will eat much more of the stalk then than when the ground is bare.

There is a difference of opinion among graziers as to the superiority of hay, or fodder, as winter food for cattle. The only difference, I think, is that fodder is less apt to constipate. With the exercise of a little skill in the management of our grazing lands, (and that consists simply in not grazing too closely,) with the aid of our meadows, which are kept up as a reserve after they are mown, we can keep our stock of all kinds without using a pound of hay, fodder or straw until the first of January. The feeding continues to the 15th of April or 1st of May, depending on the nature of the spring, when they are turned upon the pastures, and treated as you saw when here last summer.

The inquiry of late seems to have been raised as to the utility of salt for stock. I must confess that when I first saw that this question was seriously raised, I was not a little astonished, for I had supposed that if there was anything in the care and management of stock of all kinds, the utility of which was settled beyond cavil or doubt, it was the regular and generous use of salt. The avidity

with which it is sought by all ruminating animals in a wild state, seems to me ought to be conclusive of the question. Look, for instance, at the constancy and regularity with which deer resort to the natural licks in the forests, and even more so to licks made by the hunters, termed artificial licks, and to wherever cattle are salted in the mountains. But independent of this, my experience in the matter satisfies me perfectly, and every person in this county will concur in the opinion, that it is indispensable in the rearing and management of cattle—so much so that we in this county would almost as soon think of doing without grass as without salt. In using the term *cattle*, I intend it in its general sense, including horses, hogs, sheep and cows. On *neat cattle*, as an evidence of its great utility, let any one put two lots of steers, heifers, or cows, in separate fields; give one salt abundantly and regularly, and the other none; and the difference in favor of the lot salted, as to growth, fatness and general appearance, would dispel at once every shadow of doubt on the subject. The experienced buyer can tell at one glance, when he gets among a lot of bullocks, whether they have been well salted or not, particularly if the pasture in which they are is tolerably good. If they have been well salted, their hair will present a rich, soft, glossy appearance; their skins will seem to be full and loose upon them, and the animal will present a growing, sappy look, and will have licked himself much over his sides, shoulders and quarters. The animal that has failed getting his proper allowance of salt will exhibit a coat of hair of a dry, rough, husky look, standing out like bristles, and withal will be something of a Cassius in his appearance, having a lean and hungry look. We are not in the habit of sheltering the stock we design grazing, during the winter months, not deeming it at all necessary for their welfare, as they have been accustomed to the peltings of the pitiless storm, from their *calfhood* up.

In perusing the number of The Farmers' Library for this month, I noticed a remark, under the head of "Cattle of Improved Breeds," made by you, that nothing was more observable in your late rambles through the mountains of Virginia than the failure of those who breed their own cattle, to provide themselves with good bulls. The observation is true, although of late years our farmers have awakened considerably from their apathy on this subject.

There seems to be a growing desire (true, it is slow) to procure better bulls; but the "almighty dollar," as you say, chokes the growth of the desire amazingly. The *idea* of paying out $10 for a good bull-calf, is an insurmountable obstacle with many of our farmers, who are just as able to pay $100. I have argued and disputed hundreds of times on this subject with our farmers—have furnished proof upon proof of the vast advantage of breeding from improved stock—and after all, they will turn round, and with a knowing leer, answer you by saying that good grass makes a good calf—that this thing of blood is all in your eye. To instill liberal notions into our farming population on this subject, and to overcome the deep-rooted prejudices of the majority, in regard to blooded stock, will require much patience, numerous examples, and not a few years. By way of winding up this thoughtlessly-spun-out epistle, I will relate a circumstance which fell under my immediate observation, as one among ten thousand instances or proofs of the superiority of the improved stock over the ordinary stock of the country. A few weeks since, I was compelled to kill a two-year-old bull, on account of his predatory disposition, the produce of a remarkably fine Durham bull and a cow descended from the old Patton stock. He was reared, from a calf, without anything more than the ordinary attention bestowed on calves in this country—fed upon hay in the winter and grass in the summer. His net weight when killed (and he was by no means fat) was 792 lbs. The ordinary bulls of the county at five years old, when fat, would hardly reach this.

I have penned this not by any means for publication, never having written a line in my life for a journal or paper of any description, but simply to indulge in a kind of epistolary conversation with you on our mode of farming and grazing combined. I love the employment, and love to talk about it. Excuse me for thus trenching upon your time and patience, and accept the best regards of

Your friend, &c. WM. G. CAPERTON.

You are talking to one about whom there is "no tire" on such subject—one who, though he may not have time otherwise to acknowledge, will always be grateful for the favor of your correspondence. J. S. S.

SALT.

THE SUPPOSED FATTENING PROPERTY OF COMMON SALT.

The experiments of Boussingault have been, as we have seen, elsewhere more particularly referred to; but are better described in what follows from Johnston. The more recent trials of the value of *salt* in fattening *sheep*, (as fond of salt as horned cattle,) were also particularly detailed in a late number of the London Agricultural Gazette, which we sent away to an esteemed friend near Asheville, N C. In both cases the animals were weighed before the trial commenced and after being slaughtered. Their food, too, was the same precisely where the salt was given and where it was not; and with both cattle and sheep the salt proved to be superfluous.

The following are the observations of Professor Johnston:

It is known that wild animals are fond of salt, and in some countries eagerly frequent salt-licks for the purpose of obtaining it. Our domestic animals also, are known to relish it; and as the constituents of common salt are always present in the fluids of the animal body, it is believed by many to be absolutely necessary, and by more to be useful, in promoting the health of the stock to which it is given.

It is the opinion of some, also, that it has an actual feeding or fattening tendency—making the same amount of food go farther in sustaining the life of the animal, or in adding to its weight. That it has any such direct tendency, however, is rendered very doubtful by the result of some recent experiments by Boussingault. He selected a number of heifers, divided them into two lots, and fed them respectively for forty-four days on the same quantity of food, giving to the one lot a daily allowance of salt, and to the other none. At the end of the time both lots had increased equally in live-weight, and were apparently in equal health.

It does not appear, therefore, that in all circumstances common salt is likely to add to the nutritive value of the food with which it is mixed. There may be circumstances, however, in which the use of salt may cause animals to increase more rapidly in weight; and in reference to this point there are several circumstances which deserve the consideration of the practical man.

1st. When animals are fattening it is often of great consequence to induce them to consume a large quantity of food in a limited period of time. The addition of salt has the effect of giving a relish to the food, so as to awaken an appetite in an otherwise apparently satiated beast. It is thus induced to eat, and to perform upon itself, though in a less degree, the operation of cramming, by which poultry are so quickly fattened.

2d. When hay or other similar food becomes musty and offensive to cattle, a sprinkling of salt often removes their dislike, and induces them to eat what they would otherwise reject. The same food may in this way also be made to go farther.

3d. When salt is given to cattle they are more inclined to drink—in reality they drink much more water than when no salt is given. In some cases this may be an advantage, especially when the water contains any ingredients by which the health of the stock is likely to be promoted. But the thirst produced by the salt is often made to act in another way. To cattle tied up to fatten a lump of salt is presented, of which, by constant licking, they consume a large quantity. But no water is given them and they are, therefore, driven by way of slaking their thirst to consume a greater weight of the watery turnip. In this way, again, the process of cramming is promoted and a speedier fattening ensues.

4th. Lastly,—though in the experiment of Boussingault the use of salt added nothing to the comparative weight, it may be different with other kinds of food, and with crops raised in other localities. Thus it may be assumed that a

certain quantity of salt is necessary to the healthy condition of an animal. This salt it obtains from its food or from its drink. But the quantity of salt in the food varies with the kind of food, with the soil on which it is grown, with the manner by which its growth is promoted, and probably with the proximity or exposure to the sea of the locality in which the crop is raised. If the soil or manure is rich in common salt, or if the sea-spray freely reach it, the crop may abound in it to such a degree as readily to supply all that the animal to which it is given may require. If the contrary is the case the addition of salt may be necessary to the perfect health of the animal, and therefore to its profitable nourishment and growth.

The water again of our springs and rivers which always contains salt is more or less rich in this substance according as the soil or rock through which it flows is so, or according as it is near or remote from the sea. Thus in some districts what the food does not supply the drink may make up, while in others both food and drink may leave a deficiency, which the practical farmer may find it advantageous and profitable to supply. Though not directly fattening, salt may, in such cases, by promoting or maintaining the health of an animal, actually tend to a more rapid increase of its weight.

[To show how much there may be in the difference of *water* in different regions, it is enough to state that on a mill-wheel, near Newmarket, Virginia, the deposit of lime is so great in every few years as to form a complete encasement of ¼ of an inch of the arms of the wheel. *Ed. Farm. Lib.*]

USE OF CORN MEAL IN FATTENING DOMESTIC ANIMALS,

ACCORDING TO EXPERIENCE IN THE UNITED STATES.

The value and economy of Indian corn meal as food for domestic animals, as compared with other articles and especially with oil-cake, is one of the most interesting problems that can now engage the attention of scientific and practical men; and we shall feel particularly indebted to all who will aid us in the inquiry. We have no doubt of its great saving compared with other food used in England, except the oil-cake, and especially in combination with Swedish or other turnips. The question as to oil-cake rests on our want of exact information as to the cost and value of that. Every one is aware that besides its fattening properties it has, in the experience of English farmers, great value on account of the addition it imparts to the fertilizing property of the excrements of cattle fed upon it—giving, as they aver on analysis and experience, double the efficacy to a given weight of manure.

If it can be demonstrated that our corn meal may, as we doubt not it may, be so desiccated in Stafford's Patent Dryer as to keep for any length of time, and that, having regard to all ulterior uses and effects, it may be profitably substituted for *oil-cake* so much used in England, what will stand in the way of a constant and unfailing demand in that country for this most valuable American staple? Thus who can fail to see the importance of the question it presents to a large portion of American cultivators, or hesitate to give what assistance he may in the elucidation of the subject? As we have before stated, we pointed the public attention to the use and value of corn meal, as food for *fattening* cattle, in the very first number of an agricultural paper, which made its appearance in the United States, appearing in fact on the *first* but *dated* on the 2d of April, 1819, because our friends assured us of being laughed at for attempting to make April fools of all who should be silly enough to read an *agricultural* paper!! In that number was given a particular history and account of two famous oxen—

COLUMBUS AND THE DELAWARE OX—fatted by the late JOHN BARNEY of Delaware, a man of uncommon sagacity and enterprise in the line of his business as a grazier and victualer.

"Columbus" weighed alive 2,962 pounds. The "Delaware Ox" 2,688,—the rough tallow of the first was 218 pounds, of the second 273½. The net weight of the first 2,090, of the last 1,851. The loss unaccounted for in the first case was 88½, and in that of the Delaware Ox 105½. In the history of these animals, accompanied by a good portrait of the Delaware Ox that would now be looked on as a caricature, we stated: "In reply to inquiries on that point, Mr. Barney informs us that *watching the appetite* of these oxen and carefully regulating their meals according to the weather, [doubtless giving more in proportion as it was colder,] they were kept always in good health—seldom failed to eat their allowance, and were never surfeited.

He [an Englishman] considers that *in the means of fattening cattle* this country possesses, in its Indian corn, an advantage over England for which she has no adequate substitute. He gives the preference to Indian meal over every other species of food for fattening either sheep or cattle, and gives it in its dry unsifted state. But he is clearly of opinion that a much less quantity of meal will answer, and that it is eaten with a better appetite when used in conjunction with ruta-baga: of this root he has the highest opinion, agreeing with Mr. Cobbett, that it is sweeter and far more nutritious than any other vegetable used for feeding live-stock."

We have a letter on this subject from Mr. Stafford which happens at the moment not to be within reach. We shall give it, with some other opinions and facts to illustrate a question of the highest importance to the cultivators of a staple amounting probably, the past year, to 500,000,000 of bushels.

Such analyses of Indian corn as have been made in foreign countries and at home shall also be published. Our Societies and Institutes have been repeatedly urged to have the plant, in all its parts and stages of growth, analyzed, it being a subject of almost universal interest to the agricultural community; but, it would cost a little trouble to have it done, and moreover would require perhaps a few hundred dollars out of the thousands that are received and *hoarded* for speculative purposes and expenditures, beyond their proper sphere, instead of applying them to practical things—to reward philosophical investigations, and to introduce new machinery and plants and seeds, and the application of science and of steam to practical Agriculture.

NEWMARKET, Nov. 22, 1847.

Dear Sir: I received your very friendly communication of the 18th inst. inclosing a letter of introduction from my friend and acquaintance, Oliver Beirne of New-York, making inquiries of me on the mode and manner of fatting cattle with corn meal.

I have been a feeder for the last 35 years, and can only give you my own experience on the subject. I have generally fatted in the spring season 40 to 50 bullocks. I commence mealing when I turn my stock to grass—give each bullock one gallon of meal night and morning. The meal is prepared by crushing the *corn cob* with the corn, ground very fine. It makes as many bushels of meal as we have bushels of corn in the cob; so that it just doubles the quantity of meal by grinding the cob with the corn. We have no mode of ascertaining how much per day, or month, we can lay on a bullock by this mode of feeding, as we have no scales to weigh our cattle; but we suppose when we have a bullock under good way of fatting we can lay on him something like 2 lbs. *per day.* It only takes two months' grazing and feeding to fit a bullock for market provided he is in good stock order when we commence with meal. It would take double or treble the time to fatten the same animal on grass alone. We take cattle, for

the mealing process, of a small size, such as weigh about 1000 lbs. gross, or 500 net. Larger cattle would require more time and a greater quantity of meal.

Hogs are not fattened on meal in this region of country to any extent. Those who have tried it say it is a great saving of corn—I will take more time, and collect all the information on the subject of your letter that is in my reach, and will write you again.

Yours respectfully, JACOB D. WILLIAMSON.

We shall hope to hear again, and cannot too often, from a correspondent of so much practical experience. At the same time we cannot but lament the want of facilities if not of inclination among American practical farmers and graziers, for more varied and exact experiments, with a view to practical economy, in the pursuit of their business. J. S. S.

PRINCE GEORGE'S AND ANNE ARUNDEL COUNTIES, MD.

LANDS AND STAPLES—MEN AND MANAGEMENT.

If any man desire to see a superior region of country, let him traverse that, up and down and crosswise, which lies from the head-waters of South River stretching across to Bellair, and embracing the forest of Prince George's County, including all the head springs that empty themselves into the Patuxet River, down, (as far as we have personally observed,) as low as Bendict, and embracing both shores of the Patuxet and the shores of the Chesapeake Bay from the mouth of Rhode River to Drum Point, and his eye will pass over a district scarcely any, if anywhere, in the Union surpassed for natural fertility, easiness of cultivation, adaptation to the most valuable staples and fruits, and quickness, under good management, to recuperate when exhausted by that which is murderous and bad.

This region, it will be seen, embraces the whole of Calvert County. Nor, probably, in any part of the United States will the same number of agriculturists be found who better *know* what is needed to constitute good and profitable Husbandry. Among them the first Agricultural Journal attempted in the Union has been distributed for 29 years, and during all that time, with occasional intervals, Agricultural Associations have served to disseminate the knowledge of the best informed and most successful cultivators. If it may be said that a small proportion read agricultural journals, it cannot be denied that those who do freely communicate what these journals contain; and thus the best processes and latest discoveries and improvements are made known to all.

Thirty years ago, Mr. Hebb and Mr. Law were appointed by the Prince George's Agricultural Society to report the value of the exports, the preceding year, from that county. On the 19th of Oct., 1818, Mr. Hebb reported as follows: "The *only article* that I have been able to ascertain with certainty was the crop of *Tobacco*, of 1816, which according to the return of Inspectors, amounted to 4,460 hogsheads, inspected in the year 1817, as the product of the preceding year to which may be added 200 hogsheads shipped out of the county without being inspected. To this quantity, made in 1816, may be fairly added one-fourth as the increased product of the last year—equal, at the present averaged price, to $873,000, a sum perhaps not equaled by any county in the State." Tobacco must have been then at a high figure. When that report was printed, in the follow-

ing July, 1819, it was quoted at from $8 to $10 and from $10 to $12. By-the-by, we may copy here, as a curiosity in more ways than one, the very first quotation of prices in the first number of the old American Farmer, dated 1st of April, 1819.

"Tobacco may be quoted, second quality at from $9 to $11; first ditto, $12 to $13 50. Ten hogsheads from *Talbot County* sold yesterday, on credit, for $10 50 and $12 50. This article has fallen in price and is *dull sale*—little selling for cash, though there is not much in the market. Wheat—red from $1 50 to $1 60; corn 55 cts.; rye 80 cts.; oats 50 cts.; best beef, retail, 12½. 300 bushels wheat made by Mr. Robert Gamble, of Kent County, sold yesterday for $1 60."

Such was the state of the market 29 years ago. Planters, we guess, would like to have such "dull sales" reported now. There is not, in the district of country we have described, an intelligent cultivator who might not, with good management, speedily bring his land to produce 60 bushels of corn, 20 of wheat, 40 of oats or barley, and 1000 weight of tobacco to the acre; for although it may be contended that he may not have force, or capital to hire the force to put his land in the requisite condition, he might restrict the area of his cultivation to a smaller surface.

The great political misfortune of the State is, that while she has not *one-fourth* of the force necessary to cultivate her land properly, other force will not come to it under existing circumstances. Another sad misfortune is the want of a policy that would bring consumers and fashioners of agricultural produce to settle down at the door of, or very near the producers; and the want of whom restricts the cultivator to only a *few staples that will bear transportation to the distant consumer* and fashioner or manufacturer. In *practical* management, the great defect consists in *neglect of the means of accumulating home-made manure*, and in bad, careless and unskillful management of their live-stock—in not studying to know how much of each kind it would be most profitable to keep, and *how to keep and improve it.* A good and rigid *Dog Law*, and a rigid and exemplary punishment of *receivers of stolen goods*, (instead of gentlemen's speaking to and even shaking hands with the scoundrels because they are white and *have votes*)—strict regulations on these points alone would enable the landholders of the State to draw, from sheep alone, an additional *clear* income of $100,000. But alas, every man is a politician, and every man looking for office—civil or military—for himself or some near connexion. In the mean time a fearful National Debt is running up against the farmers and planters of the State, ready to come down upon their lands before they have time fully to discharge that which they have just commenced to pay off.

It was a maxim laid down with Judge Buel, who rendered more lasting service to the United States than any warrior since the days of Washington, that every good farmer should husband his resources for manure in such manner as to accumulate from 12 to 15 loads for each of his horses and cattle. At that rate there are hundreds if not thousands in these counties who should haul out from three to four hundred loads every year. *Do they do it?* and how much do they call a "load?" Is it a wheelbarrow load, or a donkey load, or as much as two well-kept yoke of stout oxen can bend their necks to? In the New-England States, where they know "a hawk from a hand saw," and call things by their right names, they write about, and speak of, and measure manure by the *cord*—so many cords, of 8 feet long and 4 feet high and 4 feet wide, in a compact, solid mass that has been well worked and turned over and *compounded.*

It was by a rare chance that, in October last, we got a ride on horseback from Upper Marlboro', in view of the beautiful and neatly and well cultivated estates of the brothers HILL, and thence across Mount Pleasant Ferry to pass a night with our friend JAMES OWENS, Jr., residing in the heart of rich and beautiful *Portland Manor*, a magnificent settlement owned by men of his name and family, and by the Halls, Thomases, Kents, &c., passing, the next morning, through the farms—*models for neat and skillful management*—of John Thomas, Doctor Fenwick and Mr. Gale, on to West River, where, instead of none, as some years since, *two steamboats* were ready to take produce and passengers to Baltimore.

The opportunity was embraced to get some information about ***Tobacco*** from one who ought to be something of a judge. Mr. James Owens, Jr. must be accounted, comparatively, yet a young planter, as he dwells within the smoke of his father's chimney, and who, though a septuagenarian, is yet hearty, active, spirited, and exemplary in all his habits—ready to mount his horse for the chase, but not ready to give way to younger men to open the gate for him when it comes to his hand. What a blessing to have such a parent spared to us for social enjoyment and the benefit of their counsels and experience! Alas! as with time, we too often take no note of such blessings but by *their loss*. The son, in this case, has been three years a member of the Prince George's Agricultural Society; and in that time has twice borne off the first, and once the second premium, for the *best hogshead of Tobacco of the year!* Being curious to learn the weights and sales of these *prize* hogsheads, and something of his experience and opinions generally, he could not tell the first, which showed a want of proper exactness in keeping his farm register, but the price they sold for was $12 per hundred in 1845, and $13 50 in 1846. That of 1846 was the one for which he took the second premium. This year he took the first premium again for tobacco, not yet sold but lately valued at $15, though if early in market would have commanded $20.

It cannot be otherwise than that something of the management and progress of a plain, intelligent, upright, industrious, unpretending planter like him who is the subject of these remarks should be acceptable to the readers of this Journal —quite as much so, we should suppose and hope, and quite as useful as the maneuvers of a troop of light horse, or items of the blood and carnage of a battle field 2,000 miles off—that is, if agriculturists were reared in a clear discernment and appreciation of the value of a peaceful, cheap and free Government and of all that most vitally concerns themselves and their posterity. In that persuasion, we give the following extract from a letter received in answer to one urging a plain statement of the facts it details, and that because an unfortunate, unreliable memory did not enable us to repeat, as we had gathered them, from personal inquiry and recollection. This statement may serve to give a general idea of the capabilities of the lands of Portland Manor, of the general course of husbandry, and the results of agricultural labor skillfully applied throughout the region referred to. It will be seen that Mr. Owens is setting, for the young men of the State, an example which all might follow, of a young farmer commencing on 190 acres of land with a very small and inefficient force, going on increasing his crops and the *fertility of his land* simultaneously, until he finds it to be his interest, and within his means, not only to rear his family in respectability and comfort and to have a welcome and a plate for a friend, but to give $60 an acre for 160 acres of land, hard by such land as would be worth $200 an acre in New England or anywhere where the awl and the lapstone, and the loom and the an-

vil, and the hatter and the miller, are close at hand to demand every peck of potatoes, and every bushel of turnips, and every bunch of onions, and every head of cabbage, and pound of butter, and pint of milk, and dozen of eggs, and barrel of apples, down even to a bunch of parsley, or a sprig of sage or thyme.

It was the fear of appearing to look too pryingly into his personal concerns that prompted the apology which may be inferred from a passage in this letter—a letter not volunteered but written with manly frankness, on our assurance that such facts may be useful, if well applied, to the young farmers of the State and the Union. For ourselves, we are free to confess that we value an exhibit like this as calculated to do more good to society than all the details of the bloodiest battle-field that any warrior's bulletin ever described—even such a field as that wherein a "*Hancock boy*," as an Editor says, writes home to his friend in Maryland that, in a late battle in Mexico, he and his brother Americans "*butchered the Mexicans like hogs in a slaughter-pen.*" Beautiful scenes to which to innure the "boys" of a christian country. Be it understood that we do not write here as a *partisan*, but as a Christian and a patriot, whose position in life makes it *his duty*, without *respect to party*, to watch over the *general Landed Interest of the country*, and who cannot but experience inexpressible affliction at seeing an accumulation of hundreds of millions of dollars of debts and pensions, for which *that* Interest must be the ultimate security, and by which, in very large proportion, it must, in some shape and form, be *ultimately paid*. We speak as an *American*, in behalf of *all parties* that make up a class far more numerous and far more liable to abuse than all others—one which exercises with so much less of union and sagacity than any other the power of self defence. Believing as we do, would it not be treason to be silent? We don't view it as a question of party politics, else prudence if not contempt would lead us to be silent; but we look upon it, (the debt of the Government,) as one accumulating to a fearful and enormous amount *against the Farmers and Planters of this Union*. So viewing it, before Heaven, would *they* respect us the more for being silent?

PORTLAND MANOR, Dec. 12, 1847.

My Dear Sir: Your letter did not reach me until Friday last, but I hasten to answer it as accurately as possible in the absence of papers and account sales, necessary to a correct statement of all the proceeds of my farm.

I think the proper distance to plant tobacco, to make it of fine texture, is 2 feet, 8 or 10 inches. In no case would I exceed it. Any distance over 3 feet increases the coarseness and thickness of the leaf, as will, also, *low topping*. My experience teaches me, if I wish to make fine tobacco, to top it as high as it will make a tolerable leaf. The number of leaves will depend very often upon the size or hight of the stalk, and again on the variety: probably you are not aware that there are many kinds of tobacco. Some will yield one-third more than others; but I prefer that of a good *quality* to a large quantity of very inferior stuff that does not pay half as well as that of better quality. As you will see, I have greatly curtailed my crop: I think I always average about 1,500 lbs. to the acre; but that average greatly exceeds the quantity generally raised to the acre. My rule in *hanging* also depends upon the size. Plants that yield from $\frac{1}{4}$ to $\frac{1}{3}$ of a pound when cured should be hung when green 8 inches apart upon the stick; the sticks should be the same distance. If it is my intention to fire, (which is nearly dispensed with generally,) I hang about 2 inches nearer than described above.

The *increase of the worm* has not been gradual but rapid; almost amounting to a plague. I attribute it to the great increase in the crop, persons being unable, from the quantity of tobacco planted, to keep the worms down, and all that were not killed went into the ground and came out breeders for the next year. I am confident that the fly that attacks the plant in spring in the bed is the *turnip-fly*. I will state my reason some future day.

In 1845 I worked three men, three boys, and two women, one of them taken off twice a day to milk, and made 38 hogsheads, weighing about 850 lbs. each ; 200 barrels corn,and 560 bushels wheat; some oats—the number of bushels not recollected.* In 1846 I added one man, one girl and one boy. I made 36 hogsheads, (the worms increased and destroyed a good deal,) 400 barrels corn, and 900 bushels wheat—the season for wheat the most unfavorable I ever knew. I took no account of the quantity of oats. In 1847, with the same force, but very much crippled by sickness, I have housed about 20 hogsheads tobacco, about 800 barrels corn, 1,000 bushels wheat, (the most sold for seed,) and 450 bushels oats. I omitted to say that I sold my crop of wheat in 1845 for seed. The gross sale of produce sent to market in 1847 will amount to about $3,400.†

To give you an idea how my crops compare with former years, I took possession of this farm in 1834. Then my force was very small indeed. I had no hands of my own: those I had on the farm were, one man, one woman, two small boys, and one very old man and woman. My largest crop then was 100 barrels corn, 12 hogsheads tobacco, and about 600 bushels wheat, was the average. In 1836 I was married. My family consisted of myself and wife and one boy ; the balance were hired servants. My family has now increased to 32 ; so you see I have to look around me and work a little harder every day.

I do not think any question that you have asked me impertinent; and do assure you that nothing could give me more pleasure than to answer them in a manner that you could easily comprehend.

Now, my dear friend, I have one request to make :—that is, that you will not ridicule my letter, as you did my bad management.‡ I am as unaccustomed to writing long letters as you are averse to bad cultivation.

I wish you would come to see me, and spend some time, then I could hear you talk, and would show you something about tobacco that I cannot write.

I omitted, in its proper place, to give my *rotation* of cultivation. When I first took possession, we wrought upon what we term the "*four*-field system." The farm was divided into four fields. The first was to fallow for wheat, then corn and tobacco, then wheat or oats, which preparad the land to receive clover seed. But finding my force increasing and my farm getting no larger, I changed, in order to have one-third of the farm to cultivate in corn and tobacco, and take chances after them for wheat, which gives me a crop from two-thirds of the farm each year.

I should have said that tobacco should not be pressed together until it is perfectly cured; then to stow it closely preserves its color. Probably it would be proper for me to say that a *single* plant, or *stick of plants*, hanging in a house, where it can have the air and influence of the sun, will cure green—it appears to be necessary to fill the house properly to get it to cure well.

I gave for Lyle's land, (160 acres,) sixty dollars per acre. The proceeds of that place in 1846 were 12 hogshead stobacco, 700 bushels wheat, and 100 barrels corn. That of 1847 will not exceed 8 hogsheads tobacco, 420 barrels corn, 550 bushels wheat, and 170 bushels oats.—The farm on which I live has 190 acres.

Your friend, J. OWENS, Jr.

[* This force was not, in what it would hire for, or in efficiency, more than equal to 6 able-bodied hands. Supposing the tobacco to be worth $5 a hundred on the farm, the corn 50 cents and the wheat one dollar—leaving out of view the oats, pork, vegetables, cattle reared, with house-rent, firewood and living for the whole family—leaving these out, and there is a product in the three items mentioned equal to $437 per hand. What State or what staples or management can beat that? *Ed. Farm. Lib.*]

[† This year the force was increased equal, say, to two efficient hands, say 8 in all—sales $3,400 or $425 each ! What is such land, with such management, not worth ? Be it remembered that, in the mean time all, black and white, have had their backs well covered, and their bellies well filled with a superabundance of the best of food. Not so much "garden sauce" as the New England farmer ; but a good ham of bacon for every Sunday, with a fat lamb, turkey or pullet, for variety—and, withal, a better appetite, and more animated, cheerful and hopeful life than falls to the lot of the town millionaire, suffering under the alternating miseries of physical satiety and the sordid yearnings of avarice. *Ed. Farm. Lib.*]

[‡ If we ventured to jeer our friend about his management, it was for a want *of neatness*—which is so delightful to look at—going, in a word, a *leetle* too much for the main chance. The plow had not run close enough to the roads and fences; and, besides, it may be that not quite force and time enough had been spared for the garden, and the dairy, and the poultry-yard, &c.—little matters that need not be too exactly enumerated, but which every housewife who is allowed to see this, will comprehend without another word from one of *their* oldest friends, the *Ed. Farm. Lib.*]

THE HOUSEWIFE'S DEPARTMENT.

THE HABITS OF INSECTS.

WHAT! a chapter on *insects*—filthy insects—for the *Housewife's Department?* Even so, good friends, a few words on what is called *Entomology* for your amusement, strange as it may appear. While there are some who would circumscribe the range of Woman's inquiries and intellectual exercise, within limits so narrow that little would remain beyond the almanac and the cookery book, we would not fly to the other extreme: yet, we hold it to be strictly within her province, as she can catch the time, to make herself passably well acquainted with the natural history of birds, plants, fruit-trees and insects; because these all fall within the sphere of her daily walks and duties; and some of them, as every housewife knows to her sorrow, within the list of her daily annoyances. The least glimpse at the variety and importance of the subject will beget a desire to pursue the study; and qualify her to participate in the so much more various conversation of her friends, and by-and-by to impart entertaining instruction to her children.

Among the most interesting of "Knight's Weekly Volumes" are, for instance, those on Insect Architecture and Bird Architecture; and who has not been agreeably surprised and delighted in following Huish, in his researches and descriptions of the habits, economy, the architecture, the industry, the policy, and even the *wars* of *bees* and *ants*! for Man is not the only creature that takes delight in slaughtering his fellow beings; but these others have not the lights of Christianity to restrain them. They are not endowed with our high faculties, nor, that we know of, enjoined from on high to "love their enemies":

> "Say, why was Man thus eminently raised
> Amid the vast creation? Why empowered
> Through life and death, to cast his watchful eye
> With thought beyond the limits of his frame?
> But that the Omnipotent might send him forth
> In sight of angels and approving worlds—
> Might send him forth the sovereign good to learn,
> To chase each meaner passion from his breast
> And through the storms of passion and of sense,
> To hold straight on, with constant heart and eye
> Still fixed upon Man's everlasting palm
> The approving smile of Heaven."

"Could mankind," says Bewick, "be prevailed upon to read a few lessons from the great Book of Nature, so amply spread out before them, they would clearly see the hand of Providence in every page; and would they consider the faculty of reasoning as the distinguishing gift of the human race, and use it as the guide of their lives, they would find their reward in a cheerful resignation of mind—in peace and happiness, under the conscious persuasion that *a good naturalist cannot be a bad man.*"

THE ADVANTAGES OF STUDYING ENTOMOLOGY BY THE AGRICULTURIST AND FORESTER, AND THE METHOD OF DOING SO.

The branch of Natural History which respects the knowledge of Insects is named, according to the generally received Greek expression, Entomology.

The intimate connection in which insects stand to Man, to domestic animals, and to the different kinds of vegetable productions, makes them well worthy the consideration of every one, and particularly of the agriculturist and the forester. Although insects are small and inconsiderable, the exceedingly great number of species, and the still greater number of individuals in many of them, ful-

ly compensate for their want of corporeal magnitude. The amount of the species of plants, and all the classes of other animals taken together, cannot (according to the latest estimates) equal in amount the species of insects, as we reckon about 300.000 species. If we consider the fecundity of many kinds of insects, which sometimes produce an offspring of several hundreds, or even thousands (the females of the termites, or white ant, producing an offspring of 40,000,) and also that some kinds produce several generations in one year, it appears evident that the number of insects can hardly be estimated. As a proof of this, which perhaps to many may appear too bold an assertion, we need only mention the enormous swarms of locusts, which are sometimes so numerous, and in such masses, that they darken the sun, and when they alight, they frequently cover several square miles of land; also the *Rhagio Columbaschensis*, Fab., a minute dipterous insect, but a fearful plague in many parts of the bannat of Temeswar, and which when congregated in the air resemble dark clouds, although each individual is not more than two lines long. Who could even reckon the myriads of gnats or midges, which in many years, like pillars of smoke, ascend in the air? Or who could succeed in ascertaining the number of inhabitants in an ant-hill? All these myriads derive their nourishment either from plants or animals, in their living state, or from their remains when dead; and there are even some to which Man himself must pay tribute with his blood.

"From such considerations are we not," says Schrank, the worthy Bavarian naturalist, "alarmed for our forests, gardens, and groves? Do not these innumerable millions of insects which incessantly labor at their destruction, confuse our understanding when we begin to reckon them, and terrify our imagination which magnifies them? And can I be believed if I assert that I discover beneficence in such unspeakable destruction, beauty in these devastations, wisdom in this disorder, and life in this manifold death? Nevertheless it is so. Whatever many may say of Nature growing old, the naturalist finds her always young and beautiful, always estimable, just as she came from the hand of her Creator, and as she indeed every moment issues afresh from the hand of the Almighty Being. In His hand the youth of Nature is continually renewed; and under His all-ruling Providence, all the millions of apparently destructive beings only labor in preserving her existence and embellishment.

"Let us here contemplate the whole economy of Nature at a general glance, in respect to forests only; and let us view her as she is, without the aid of Man, who often disturbs her general arrangement.

"Insects that feed on wood are not injurious to ligneous plants, except from their disproportionate numbers; and these numbers, when left to bountiful Nature herself, are never disproportionate: two assertions which, however paradoxical they may seem at first sight, are yet admitted by the naturalist, who has proofs of them daily before his eyes, as principles, but which I must here demonstrate, because many persons who are engaged in studying the works of Nature, either as professional men, or as amateurs, are not naturalists.

"In a work on the Fruitfulness of Plants [also written by Schrank] it is stated that an elm twelve years old in one single year produces 164.500 seeds; which in the course of another twelve years, (if no accident happened) would become as large trees as their parent: and from this calculation it appears that a succession of much more than 26,960 millions of trees might be obtained from one.

"This calculation is made from the fruit only, and not from the blossoms of any tree, and is, therefore, applicable to all other trees. A single species of trees, such as we have them in one of our provinces the most scantily clothed with trees, would during the life of man cover a large extent of land with a thick forest, and after a few centuries it would appear as if the whole world had been made for it only—as if it alone would cover the whole extent of dry land.

"The great multiplicity of organized beings which makes the world as it is at present so beautiful, would then have disappeared; symmetry, which gives a charm to this multiplicity, and which delights the contemplator of Nature in exalted enthusiasm, would have vanished; soon would all animal life in the habitable world be destroyed; a great number of birds which live only on insects which eat wood, we have already annihilated, by our presuppositon that these insects do not exist; the thick, impenetrable forest, which the kind of tree mentioned would cover, would soon supplant every blade of grass, kill every insect intended to live upon it, every bird to which these insects were intended as food, destroy all animals living upon grass that could not reach the tops of the high forest trees, and finally kill every beast of prey, which could not at last even find a carcass to satisfy its ravenous hunger.

"This is but too faint a picture of our earth, which without the insects that live on wood, would be but too true. A wise Hand has scattered them everywhere, and given to each kind its particular instinct, its peculiar economy, and great fecundity. With them, order and life are restored to universal Nature. On their side, pursued by powerful, or weak, but not less numerous enemies, they unceasingly follow the given commands of Providence.

"The proportion which exists between their increase and the occasion for it, and their enemies, secures Nature from the devastations which they would occasion, and restores all to the most admirable equality.

"A forest of firs more than a hundred years old, has already nearly terminated its

appointed existence. A host of caterpillars first take possession of the branches, and consume the foliage. A superfluity of sap, (the circulation of which is rendered languid by the failing strength of the tree,) an unnatural increase of the nourishing juices between the bark and wood, and the separation of these parts, are the consequences.

"Another host of insects now appears; they bore through the rind into the inner bark, which they eat, and pierce through; or into the wood, which they pierce and destroy. The diseased trees are now nearly dead; the numerous destructive insects increase with the sickness which attracted them there; each tree dies of a thousand wounds, which it receives externally, and from the enervation which follows in consequence. The dissolution is accomplished by a third host of, for the most part, smaller insects, but still more numerous; and these are continually employed in reducing the decayed trunks to dust as soon as possible, while at the same time a thicker forest of young trees, and generally of a different kind, spring out of the earth, which had afforded nourishment to the dead tree. The first host certainly occasioned the deathly sickness of the forest; the second accelerated its death; and the third accomplished its total destruction. It need not be lamented. These trees would have died a few years later, without any utility resulting from their death. Their leafless stems would probably have remained there for half a century awaiting their destruction, of no use where they stood, and serving no purpose but as a fearful trophy of death in the field of life. They must die, because they are organic matter. But we only destroy a worn-out vessel, that a better may take its place, but are not able to make anything better out of it. It is not so with Nature. Millions of sensitive beings find a use in the remains of these dying trees, and under every step of near and approaching death thousands spring forth endowed with vitality.

"Each host of these insects are again exposed to destroyers, which put a check to their too great extension. Other insects, and a great number of birds, clear away the caterpillars while they are feeding on the leaves, and when they have undergone their change, and are lying in the earth, the wild boar comes and stirs them out from their place of rest with his tusks, and devours them with the greatest eagerness. Those insects which conceal themselves in the inner bark or wood do not share a better fate. The woodpecker knows where to find them, and draws them out of the deepest holes. When they appear on the bark in the perfect state, they have the bitterest enemies in the fly-catcher, the tree-creeper, and all kinds of magpies. Whole hosts of these birds are found where these insects abound in multitudes; but they leave the place and disperse themselves as soon as the superfluity of nourishment is exhausted.* In this state all Nature is on a perfect equality; but Man comes, and destroys the order—he annihilates the harmony of Nature, and is astonished at the discordance. First, he sacrifices the wild boar to gratify his palate; takes possession of the wood, and, according to the usual fallacy of taking the consequences for the cause, considers the woodpecker his enemy, and finally, under various pretences, wages war with all the birds of the forest.† Insects appear to him too contemptible for his pursuit, too small, too numerous, and too well concealed, to reward him directly for the trouble of endeavoring to extirpate them. They may, therefore, go on with their occupations undisturbed, and if they carry them too far, he then complains of Providence.

"After having wrested the lordship of the woods from the animals, we should pursue with wisdom the economy which heretofore the animals, from a blind impulse of Nature, had practiced. We should anticipate nature in her operations, and cut down trees that approach weak old age, or those that are checked in their growth by a stronger tree standing near them, or those that have been killed by lightning; and the teeth of the boar which prepared the earth for the seeds, should be replaced by the pickax, and our tame pigs ought to be employed in digging up the earth-grubs, which the boar was accustomed to do. We only are to blame if our finest forests are destroyed," &c. Such are the expressions of a practical naturalist on insects which are injurious to forests. A similar picture may be formed of those which attack fruit-trees, field fruits of all kinds, and even our domestic animals.

The result of such contemplations will be, that we can only protect ourselves from the injurious influence of insects by an ample knowledge of the reciprocal relation in which one stands to another, and in order to obtain this, it is essentially necessary to acquire a knowledge of those kinds which are directly or indirectly injurious to Man, their different stages of life, their nourishment, propagation, duration, and finally their natural enemies.

From what has been said, the importance of an understanding of Entomological existence is sufficiently clear.'

* Not only does this abundant prevalence, in proportion to the numbers of insects which constitute their food, occur in the feathered tribes, but it has also been observed in the parasitic and insectiverous insects, and that not merely as a more numerous congregation, but as an actual increase of numbers. Thus it has been observed, that when the processionary caterpillars are especially abundant, the brilliant beetle *Calosoma sycophanta*, which feeds upon them in the perfect state, is produced in equal proportion. The causes which operate in the production of a more than ordinarily numerous supply of the injurious insects, seem equally favorable to the increased development of their enemies.

† A most characteristic anecdote, in illustration of this observation, is given by Mr. Spence in the Introduction to Entomology, respecting the rook, v. i. p. 31.

Recipe for making Potato Pudding.—Take one pound of potatoes, half a pound of fresh butter, mix them well together and press them through a cullender; then add the *yolks* of eight eggs, the *whites* of four eggs, half a pound of sugar, and a tea-spoonfull of butter—to which add mace, citron, or currants, if you choose. S.

In our last we gave you a recipe for buckwheat cakes; but as the idea of soda is startling, and may frighten you from that, we give another which you may rely upon as being *first-rate.*

To make Buckwheat Cakes.—Warm the earthen pot well by the fire before the meal is put into it; but do not let it be so hot as to scorch the meal. To one-half peck of buckwheat meal put a common sized tea-cupfull of good yeast—first mixing the meal with water the warmth of new milk, and some salt in it—and mix it well together with the yeast. The batter should be made about the same consistency as that for pancakes. If the batter is set about midnight it will be ready for cakes at breakfast—at about 8 or 9 o'clock in the morning—if set with good yeast. A deep pan should be put under the pot, and the pot containing the batter should be set near the fire, but not too near or it will turn sour.

These cakes to be served up "hot and hot," and eaten with an abundance of good butter; to which some may choose to add nice syrup or honey, but *not molasses*, if in a Christian country. S.

To Cure Injuries to Trees.—When the ornamental or fruit trees, in yard or garden, which may happen to be *your* pets, get injured, as they often do, by the carelessness of menfolks, you should remember that such wounds of the bark or body not only injure and impair the growth and beauty of the tree, but it is in such injuries, precisely, that insects choose to deposit their eggs. The best thing to be done then is to scoop out the decayed part, bark and wood, and cover the wound with a good coat of tar, to which should be added a little tallow and saltpetre, to be renewed from time to time as it happens to be exhaled. This application, it is said, will prevent rapid decay, offend the insects, and assist the growth of a new bark over the wound. What a field does the study of insect and vegetable life open to the female mind, and how congenial to her domestic duties and position in life!

The Wife.—It needs no guilt to break a husband's heart; the absence of content, the mutterings of spleen, the untidy dress, the cheerless home, the forbidding scowl and deserted hearth: these, and other nameless neglects, without a crime among them, have harrowed to the quick the heart's core of many a man, and planted there beyond the reach of cure, the germ of dark despair. Oh! may Woman, before that sight arrives, dwell on the recollections of her youth, and, cherishing the dear idea of that tuneful time, awaken and keep alive the promise she then so kindly gave. And, though she may be the injured, not the injuring one—the forgotten, not the forgetful wife—a happy allusion to the hour of peaceful love—a kindly welcome to a comfortable home—a smile of love to banish hostile words—a kiss of peace to pardon all the past, and the hardest heart that ever locked itself within the breast of selfish man, will soften to her charms, and bid her live, as she had hoped, her years in matchless bliss—loved, loving, and content—the soother of the sorrowing hour—the source of comfort and the spring of joy. [Chambers's Journal.

Polishing.—The ladies are very fond of keeping the door-knobs, spoons, plates, &c., in brilliant order. Now, if instead of water and chalk and such preparations, ladies will use *camphene and rotten stone*, a far brighter, more durable, and quicker polish can be obtained than in any other way. Camphene is the article used for producing the exquisite polish of Daguerreotype plates; and nothing has been found to equal it.

To destroy Red Ants.—Every housekeeper may not know how to get rid of these troublesome little intruders. Place a piece of fat bacon, or a pan of grease or butter, near the place where they enter the kitchen or pantry. This will soon attract them together, when they can be easily removed, or destroyed by a little hot water. Thousands may be destroyed in this way in a few days.

LETTER XIII.

WINTER MANAGEMENT OF SHEEP.

Use of Rams—proper age, number, &c.—selecting ewes for—different methods of coupling—way to treat rams...Division of Flocks for Winter...The Hospital...Yards—when necessary...Feeding-Racks—various plans of—the Box Rack—the Hole Rack—the Sparred Rack—the Hopper Rack—their respective advantages—improvements suggested...Troughs...Grain-Boxes...Barns and Sheds—necessity of shelter at the North—the common Northern Sheep-Barn...Stells—the Outside Stell—Ancient Stells—Inside Circular Stell—Circular Stell fitted up with racks...Tree-Coverts...Cheap Sheds—fitted between stacks, barracks, &c...Value of Barracks for the Preservation of Fodder...The Main Sheep-Barn of the Farm or Plantation, with Shearing-Floor, &c.—arrangements for breeding-ewes...Feeding sheep in yards with other stock—improper—reasons...Hay-Holders...Winter Dry Feed for Sheep—Variations in Feed—German views on this subject—proper kinds of fodder—Boussingault's Table of the Nutritive Equivalents of different kinds of Fodders...Effect of Food in the Production of Wool—De Reaumur's Table showing the Effects of Food in this particular...Effect of Food in producing Fat and Muscle...Fattening Wethers in the North...Feeding Grain to Store-Sheep in Winter—when practiced at the North—economy of so doing—kinds of grain preferred—necessity of regularity in quantity—difficulty of raising the condition of poor sheep in the winter...Feeding Roots, Browse, &c —Roots a Substitute for Grain—to what sheep they may be fed—Hemlock Browse—when and in what manner useful—substitutes for...Winter Feed of Breeding-Ewes...Necessity of regularity in the times of feeding sheep...Salt...Water.

Dear Sir: As the turning out of the rams usually takes place, here, on the first day of winter, I will describe the proper accompanying arrangements, as the first step in winter management.

Use of Rams.—The period of gestation in the ewe averages five months. Merino rams are frequently used from the first to the tenth year, and even longer. The lambs of very old rams are not supposed to be as vigorous as those of youngish or middle-aged ones, but where rams have not been overtasked, and have been properly fed, I confess I have been able to discover very little difference in their progeny on account of age. A ram lamb should not be used, as it retards his growth, injures his form, and, I think, permanently impairs his vigor and courage. A yearling may run with 30 ewes, a two-year-old with from 40 to 50, and a three-year-old with from 50 to 60. Some very powerful, mature rams will serve 70 or 80 ewes; but 50 is enough, where they *run with* the ewes. I am satisfied that an impoverished and overtasked animal does not transmit his individual properties so decidedly to his offspring as one in full vigor.

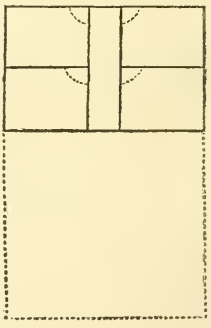
Several rams running in the same flock excite each other to an unnatural and unnecessary activity, besides injuring each other by constant blows. It is, in every point of view, bad husbandry, where it can be avoided, and, as usually managed, is destructive to everything like careful and judicious breeding. The nice adaptation which the male should possess to the female, already discussed under the head of Principles of Breeding—counterbalancing her defects with his own marked excellence in the same points, and, in turn, having his defects counterbalanced by her excellencies—how shall this be accomplished, where half a dozen or more rams are running promiscuously with two or three hundred ewes?

Before the rams are let out, the flock-master should have all the breeding-ewes brought together in one yard. He has carefully inspected his stock rams and noted every defect and peculiarity of their fleeces and forms. The breeding register is before him to settle every pedigree, provided his stock rams are nearly enough connected with some portions of the flock to render it necessary to guard against in-and-in breeding. The shepherd catches a ewe and places her before him. The pedigree being

determined, he first notes her form, and then opening the wool on the shoulder, thigh and belly, notes the length, thickness, quality, and style of the staple. If he kept the minutes at shearing recommended by me (under the head of "Selection") it will save much time and lead to far more accurate classification. When every point in the ewe is determined, he decides which ram, on the whole, is best calculated to perpetuate her excellencies both of fleece and carcass, and best counterbalance her defects in their mutual offspring. With a pigment composed of Venitian red and hog's lard, he then, as has been already mentioned under the head of Registering, gives the ewe a mark which will last until the next shearing, which will show by what ram she was tupped. Those selected for each ram are placed in *different* inclosures, and the chosen ram placed with them. In four weeks' time, the rams are withdrawn, and the flocks doubled or otherwise reärranged for winter, as may be necessary. This looks like taking considerable trouble, but having practiced it for years on my farm, and having always made these selections myself, I know that in reality the trouble is very slight—*nothing*, when the beneficial results are taken into consideration. With a couple assistants, to catch, a day would suffice for effecting the proper classification and division of several hundred ewes.

Where choice rams are scarce, so that it is an object to make the services of one go a great way—or where it is impossible to have separate inclosures, (as on farms where there there are a great number of breeding-ewes, or where the shepherd system is adopted to the exclusion of fences,) the following method may be resorted to. Build a hut containing as many apartments as you wish to use rams, with an alley between them. That part of fig. 30 which is surrounded by black lines represents the hut divided into four apartments, each furnished with a feeding-box and trough in one corner. Gates or bars open from each apartment into the alley, and at *each end* of the alley. The dotted lines inclose a yard just sufficient to hold the flock of breeding-ewes.

Fig. 30.



A couple of strong rams (of any quality) for about every hundred ewes, are then aproned, their briskets rubbed with Venitian red and hog's lard, and they are let loose among the ewes. Aproning is performed by sewing a belt of coarse sacking broad enough to extend from the fore to the hind legs, loosely but strongly round the body. To prevent its slipping forward or back, straps are carried round the breast and back of the breech. It is indispensable that it be made *perfectly secure*, or all the labor of this method of coupling will be far worse than thrown away. The pigment on the brisket should be renewed every two or three days—and it will be necessary, usually, to change the "teasers," as these aproned rams are called, about once a week, as they do not long retain their courage under such unnatural circumstances. Twice a day the ewes are brought into the yard in front of the hut. Those marked on their rumps by the teasers are taken into the alley. Each is admitted to the ram for which she is marked *once*, and then goes out at *the opposite end of the alley from which she entered*, into a separate field from that containing the flock from which she was taken. A powerful and vigorous ram from three to seven years old, and properly fed, can thus be made to serve from 150 to even 200 ewes, with no greater injury than from running loose with 50 or 60.

This, too, looks like a great amount of labor to attain the result sought, but having had it formerly practiced for two years on my farm, I know that when conducted with system, and by a prompt and handy shepherd, it consumes no great amount of time.

Rams will do better, accomplish more, and last two or three years longer, if daily fed with grain, when on service, and it is well to continue it, gradually decreasing the quantity, for a few days after they are withdrawn from the flock of ewes. A ram should receive the equivalent of from half a pint to a pint of oats, daily, when worked hard. They are much more conveniently fed when kept in huts. If suffered to run at large, they should be so thoroughly tamed that they will eat from a measure held by the shepherd. Careful breeders thus train their stock-rams from the time they are lambs. It is very convenient, also, to have them halter-broke, so that they can be led about without dragging or lifting them. An iron ring attached to one of the horns, near the point, to which a cord can be attached for leading, confining, &c., is very useful and handy. If rams are wild, it is a matter of considerable difficulty to feed them separately, and it can only be effected by yarding the flock and catching them out. Some breeders, in addition to extra feeding, take the rams out of the flocks nights, shutting them up in a barn or stable by themselves. There is no objection to this practice, and it is a great saving of their strength.

Rams should not be suffered to run with the ewes over a month, at least in the North. It is much better that a ewe go dry than that she have a lamb later than the first of June. And after the rutting season is over, the rams grow cross, frequently striking the pregnant ewes dangerous blows with their heavy horns, at the racks and troughs.

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Division of Flocks.—If flocks are shut up in small inclosures during winter, according to the Northern custom, it is necessary to divide them into flocks of about 100 each, to consist of sheep of about the same size and strength. Otherwise the stronger rob the weaker, and the latter rapidly decline. This would not be so important where the sheep roam at large, but even in that case some division and classification are necessary, —or, at all events *best*. It is best, indeed, as already stated, even in summer. The poorer and feebler can by this means receive better pasture, or a little more grain and better shelter in winter.

By those who grow wool to any extent, breeding ewes, lambs, and wethers are invariably kept in separate flocks in winter; and it is best to keep yearling sheep by themselves with a few of the smallest two-year-olds, and any old crones which are kept for their excellence as breeders, but which cannot maintain themselves in the flock of breeding-ewes.

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The Hospital.—Old and feeble, or wounded sheep, late-born lambs, etc., should be placed by themselves, if the number does not even exceed a score. They require better feed, warmer shelter, and more attention. But after all, unless the sheep are of a peculiarly valuable variety, it is better to sell them off in the fall at any price,—or to give them to some poor neighbor who has time to nurse them, and who may thus commence a flock.

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Yards.—Experience has amply demonstrated, that in the climate of the Northern and Eastern States—where no grass *grows* from four to four and a half months in the winter—and where, therefore, all that can be obtained from the ground is the repeatedly frozen, innutritious herbage left in the fall—it is better to keep sheep confined in yards, excepting where the ground is covered with snow. If suffered to roam over the fields at other

times, they get enough grass to take away their appetite for dry hay, but not enough to sustain them; they fall away, and towards spring they become weak, and a large proportion of them frequently perish. I speak, of course, of flocks of some size, and on properly stocked farms. A few sheep, with a boundless range, would do better.

Some of our flock-masters let out their sheep occasionally for a single day, during a thaw; others keep them entirely from the ground until let out to grass in the spring. I prefer the former course, where the sheep ordinarily get nothing but *dry* fodder. It affords a healthy laxative, and a single day's grazing will not take off their appetite from more than one succeeding dry feed. It is necessary, here, to keep the sheep in the yards until the feed has got a good start in the spring, or they, particularly breeding-ewes, will get off from their feed, and get weak at the most critical time for them in the year.

Yards should be firm-bottomed, dry,—and they should, (in *this* climate,) be kept well littered with straw.

My impression is that the yarding system will never be practiced to any extent in the South. It certainly should not be, where sheep can get their living from the fields. How far, and under what circumstances, they will do this, has already been sufficiently discussed in my preceding Letters.

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Feeding-Racks.—When the ground is frozen, and especially when covered with snow, the sheep eats hay better on the ground than anywhere else. When the land is soft, muddy, or foul with manure, they will scarcely touch hay placed on it. It should then be fed in racks.

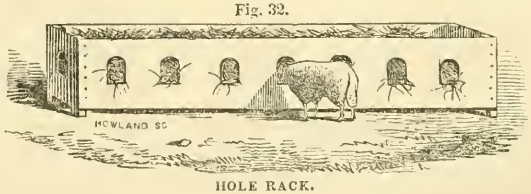
These are of various forms. Figure 31 gives the common box rack, in the most general use in the North. It is ten feet long, two and a half wide, the lower boards a foot wide, the upper ones about ten inches, the two about nine inches apart, and the corner posts three by three, or three and a half by two and a half inches. The boards are spiked on these posts by large flat headed nails wrought for the purpose, and the lower edges of the upper boards and the upper edges of the lower ones are rounded so they shall not wear the wool off from the sheep's necks. The lower boards and the opening for the heads, should be two or three inches narrower for lambs. If made of light wood, as they should be, a man standing in the inside and middle of one of these racks, can easily carry it about—an important desideratum. Unless overfed, sheep waste very little hay in them.

Fig. 31.

BOX RACK.

A capital shed or barn rack is represented in the following cut. The

Fig. 32.



HOLE RACK.

holes are eight inches wide, nine inches high, and eighteen inches from center to center. Sheep do not crowd and take advantage of each other

so much with these as with box racks. But they would be too heavy and unnecessarily expensive for a common out-door rack. Fig. 32 represents a *box*, the front formed of a board nailed on horizontally, but they are usually formed by nailing the boards perpendicularly, the bottoms on the sill of a barn, and the tops to horizontal pieces of timber.

In the South, as in England, racks will not be so necessary for that constant use to which they are put in colder countries, as for *depositories* of dry food, for the *occasional* visitation of the sheep. In soft warm weather, when the ground is unfrozen, and any kind of green herbage is to be obtained, sheep will scarcely touch dry fodder—though *the little they will then eat will be highly serviceable to them.* But in a sudden freeze, or on the occurrence of cold storms, they will resort to the racks, and fill themselves with dry food. By an instinct beautifully illustrative of the providence of the Creator, sheep anticipate the coming storm, and eat an extra quantity of food to sustain the animal heat, during the succeeding depression of temperature. They should always have racks of dry fodder to resort to in such emergencies.

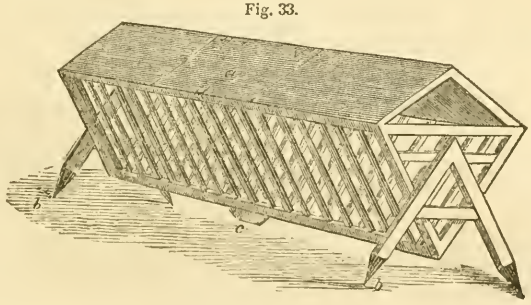
These occasionally used racks should have covers or roofs to protect their contents from rain, as otherwise the feed would be often spoiled before but a small portion of it was consumed. Hay or straw saturated with water, or soaked and dried, is only eaten by the sheep as a matter of absolute necessity. The common box rack (fig. 31) would answer the purpose very well by placing on the top a triangular cover or roof formed of a couple of boards, (one hung at the upper edge with iron or leather hinges so that it could be lifted up like a lid;) making the ends tight; drawing in the lower edges of the sides so that it shall not be more than a foot wide on the bottom; inserting a floor; and then mounting it on and making it fast to two cross sills four or five inches square to keep the floor off from the ground, and long enough to prevent it from being easily overturned. The lower side board should be narrower than in fig. 31, on account of the increased hight given its upper edge by the sills.

Still better, but somewhat more expensive, would be a rack of the same construction, with the sides like those of fig. 32.

Or, the sides might consist of rundles as in fig. 33. In either of the preceding, the top might be nailed down, and the fodder inserted by little doors in the ends.

The following form and description of an English rack is from the "Book of the Farm."*

Fig. 33.



SPARRED RACK.

"I have found," says Mr. Stephens, "this form convenient, containing as much straw at a time as should be given, admitting the straw easily into it, being easily moved about, of

* It will be found in the reprint of this splendid work, in The Farmers' Library, vol. ii, p. 449.

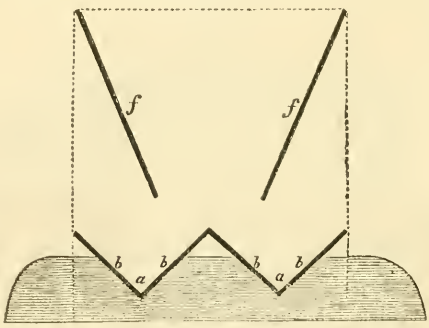
easy access to the sheep, and being so near the ground as to form an excellent shelter. It is made of wood, is 9 feet in length, 4½ feet in hight, and 3 feet in width, having a sparred rack with a double face below, which is covered with an angled roof of boards to throw off the rain. The rack is supported on two triangular-shaped tressels *b*, shod with iron at the points, which are pushed into the ground, and act as stays against the effects of the wind from either side. The billet *c*, fixed on the under or acute edge of the rack, rests upon the ground, and in common with the feet, supports it from bending down in the middle. The lid *a* is opened on hinges when the fodder is put into the rack. . . . . Such a rack is easily moved about by two persons, and their position should be changed according to a change of wind indicative of a storm."

I used racks formed of rounds (or "sparred") for several years, and found them decidedly *objectionable*. The sheep grasping a lock of hay in its mouth, brings the head to its *natural position*, and then draws in the *adhering* fibres in the process of mastication. But when eating from a rack, *it will not pick up the hay which it drops under foot.* In the box or hole racks (figs. 31 and 32) most sheep will not withdraw their heads from the openings, as they can there hold them in the ordinary position for mastication, and as, if they *step back* to do so, they are very liable to be crowded out of their places. The hay, therefore, is not drawn out of the rack, and if any is dropped, it falls within it and is saved. At a sparred rack, the sheep will not keep its nose between the rundles (in a horizontal or upward position) until it *detaches* a mere mouthfull of hay. It will, particularly when partly sated, *twitch out* its fodder prior to mastication, and all which scatters off and drops to the ground, is trampled under foot and wasted, except for the mere purpose of manure. A considerable loss will always result from this cause.

And there is another objection to this form of rack, particularly where it runs down to an acute edge on the bottom, as in fig. 33. The sheep frequently drawing the hay from the lower part, will shake down from above hay-seeds and chaff into the wool on their head and necks; and the wind will sometimes carry these as far as their shoulders and even their backs. As heretofore remarked, these cannot be washed out, and they materially lower the market value of the wool.

The following rack has been used and is highly approved by my friend, George Geddes, Esq., of Fairmount, N. Y., to whom I am indebted for the drawing and description of the cut. It serves both for a rack and feeding-trough.

Fig. 34.



THE HOPPER-RACK.

"The above is intended to represent a section of what I think the best sheep-rack I have seen.

"A piece of durable wood about 4½ feet long, 6 or 8 inches deep, and 4 inches thick, has two notches, *a*, *a*, cut into it, and two troughs, made of inch boards, *b*, *b*, *b*, *b*, placed in

these notches, and nailed fast, constitutes the foundation. If the rack is to be 14 feet long, three sills will be required. The ends of the rack are made by nailing against the side of the sill-boards that reach up as high as it is desired to have the rack, and nails driven through these end-boards into the ends of the side-boards *f, f,* secure them. The sides may be farther strengthened by pieces of board on the outside of them, and fitted into the trough. A roof may be put over all if desired. With a roof, the fodder is kept entirely from the weather, and no seeds or chaff can get into the wool."

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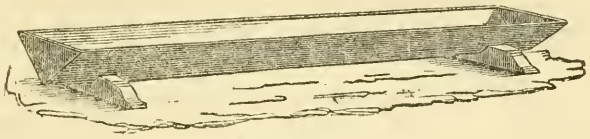
Troughs.—Threshed grain, chopped roots, &c., when fed to sheep should be laid in troughs. With any of the preceding forms of racks, excepting fig. 34, a separate trough would be required. For a number of years I have used those of the following form, and have found them every way satisfactory.

Fig. 35.



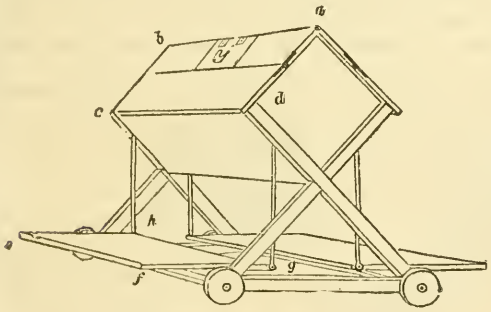
SHEEP-TROUGH.

One of the side-boards is usually about ten and the other eleven inches wide. The feet are commonly of two-inch plank, rising high enough on the sides to keep the sides of the trough firm in their places.

In our snowy climate they are turned over after feeding, and when falls of snow are anticipated, one end is laid on the yard fence.*

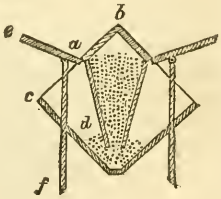
The following elaborately ingenious contrivance for keeping grain where sheep can feed on it *at will*, is from the "Book of the Farm," and I append the author's description of it.†

Fig. 36.



GRAIN BOX FOR SHEEP.

Fig. 37.



VERTICAL SECTION OF INTERIOR OF GRAIN BOX.

"There is a mode of preserving corn (grain) for sheep on turnips which has been tried with success in Fife. It consists of a box like a hay-rack, in which the grain is at all times kept closely shut up, except when sheep wish to eat it, and then they get it by a simple contrivance. The box *a b* contains the grain, into which it is poured through the small hinged lid *y*. The cover *c d* concealing the grain, is also hinged, and when elevated the sheep have access to the grain. Its elevation is effected by the pressure of the sheep's fore-feet upon the platform *e f*, which, moving as a lever, acts upon the lower ends of the upright rods *g* and *h*, raises them up, and elevates the cover *c d*, under which their heads then find admittance into the box. A similar apparatus gives them access to the other side of the box. The whole machine can be moved about to convenient places by means of

* To you, Sir, living on the ocean shore of South Carolina, and who, I think, have not visited the North, in the depth of winter, the idea of a farmer's finding the racks used by him the day before, buried under from eighteen inches to three feet of snow, and having to *dig them out*, may be rather an odd one! But, nevertheless, it is a matter of no *very* rare occurrence, at least at the lowest depth mentioned.

† See Farmers' Library, vol. ii., No. 10, p. 476.

four wheels. The construction of the interior of the box being somewhat peculiar, another, fig. 37, is given as a vertical section of it, where *b* is the hinged lid by which the grain is put into the box, whence it is at once received into the hopper *d*, the bottom of which being open, and brought near that of the box, a small space only is left for the grain to pass into the box, the hopper forming the grain-store; *a* is the cover of the box raised on its hinges by the rod *f*, acted upon by the platform *e f*, fig. 35; and, when in this position, the sheep put their heads below *a* at *c*, and eat the grain at *d*. Machines of similar construction to this have also been devised to serve poultry with grain at will."

I never have thought it best in feeding or fattening *any animals*, or, at all events, any quadrupeds, to allow them grain *at will*—preferring stated feeds; and the same remark is applicable to fodder. If this system is departed from in using depository racks, as heretofore recommended, it is because it is rendered necessary by the circumstances of the case. A Merino store-sheep, allowed grain *ad libitum*, would stand a chance to inflict an injury on itself, and I cannot but believe that grain so fed would generally be productive of more injury than benefit.

—

Barns and Sheds, &c.—Sheep barns and sheds, at the North, are frequently made very elaborate contrivances—particularly on *paper*. But expensive barns, with feeding-cellars and other arrangements for keeping sheep *within doors* during a greater portion of the winter, would, it strikes me, be entirely out of place in the South. Even in our rigorous climate, none but the breeders of Saxons pretend to make a regular practice of feeding under cover.

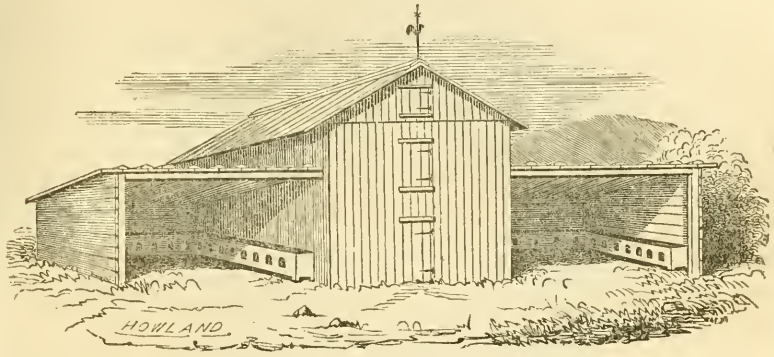
Humanity and economy both dictate, here, that sheep be provided with shelters to lie under nights, and to which they can resort *at will*. In our severe winter storms, it is sometimes necessary, or at least by far the best, to feed under shelter for a day or two. It is not an uncommon circumstance in New-York and New-England, for snow to fall to the depth of 20 or 30 inches within 24 or 48 hours, and then to be succeeded by a strong and intensely cold west or north-west wind of two or three days' continuance,* which lifts the snow, blocking up the roads, and piling huge drifts to the leeward of fences, barns, &c. A flock without shelter will huddle closely together, turning their backs to the storm, constantly stepping and thus treading down the snow as it rises about them. Strong, close-coated sheep do not seem to suffer as much from the cold, for a period, as would be expected. But it is next to impossible to feed them enough or half enough, under such circumstances, without an immense waste of hay —entirely impossible, without racks. The hay is whirled away in an instant by the wind, and even if racks are used, the sheep leaving their huddle where they were kept warm and even moist by the melting of the snow in their wool, soon get chilled and are disposed to return to their huddle. Imperfectly filled with food, the supply of animal heat is lowered, and at the end of the second or third day, the feeble ones have sunk down hopelessly, the yearlings and oldish ones have received a shock which nothing but careful nursing will recover them from, and even the strongest have suffered an injurious loss in condition.

Few holders of more than 40 or 50 sheep now attempt to get along here without some kind of shelters. The following (fig. 38) is a very common form of a Northern sheep-barn with sheds. The sheds front the south, or, what is a better arrangement, one fronts the east, and the other, being turned to a right angle to the direction of this, fronts the south. I have represented hole racks, as in fig. 32, running round the sheds, as, although not yet in general use, they are undoubtedly the best in such sit-

* These terrible wind-storms are of much longer continuance in many parts of New-England.

uations. The sheds are not usually framed or silled,—but are supported by posts of some durable timber set in the ground. The roofs are formed of boards "battened" with slabs. The barn has no partitions within, and is entirely filled with hay.

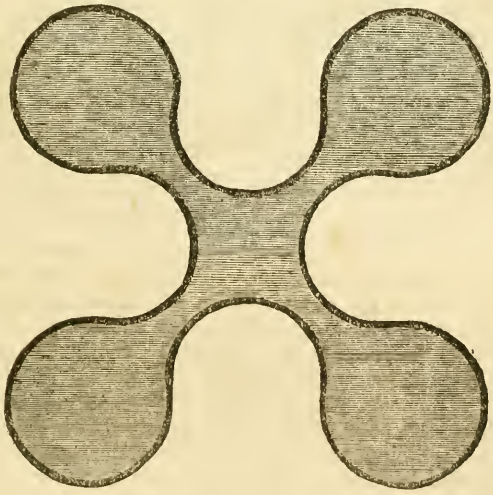
Fig. 38.



SHEEP-BARN.

There are many situations where these open sheds are very liable to have snow drifted under them by certain winds, and they are subject in all cases in severe gales, to have the snow carried *over* them to fall down in large drifts in front, which gradually encroach on the sheltered space, and are very inconvenient—particularly when they *thaw*. I therefore much prefer sheep-houses covered on all sides, with the exception of a wide door-way for ingress and egress, and one or two windows for ventilation when it is necessary. They are convenient for yarding sheep, for the various processes where this is required, as for shearing, marking, sorting, "doctoring,"

Fig. 39.



THE OUTSIDE STELL.

&c., and especially so, for lambing places or the confinement of newly shorn sheep in cold storms. They should be spacious enough, so that in

addition to the outside racks, others can be placed temporarily through the middle when required.

In many parts of Scotland, "Stells," as they are called, are made use of to shelter sheep. Fig. 39 on the preceding page is the form of one given in "The Book of the Farm," and the author's description of it:

"In a storm, their provender cannot be given to the sheep upon snow, safely and conveniently, as ground-drift may blow and cover both; and no place is so suitable for the purpose as a *stell*. . . . . It may be formed of planting or high stone-wall. Either will afford shelter; but the former most, though most costly, as it should be fenced by a stone-wall. Of this class I conceive the form represented (fig. 38) a good one, and which may be characterized as an *outside* stell. . . . . The circumscribing strong black line is a stone-wall six feet high; the dark ground within is covered with trees. Its four rounded projections shelter a corresponding number of recesses embraced between them, so that let the wind blow from what quarter it may, two of the recesses will be always sheltered from the storm. The size of this stell is regulated by the number of sheep kept; but this rule may be remembered in regard to its accommodation for stock, that each recess occupies about ¼ part of the space comprehended between the extremities of the 4 projections; so that in a stell covering 4 acres—which is perhaps the least size they should be, every recess will contain ½ an acre."

The two following are forms of stells, composed of stone-wall, without planting.

Fig. 40.

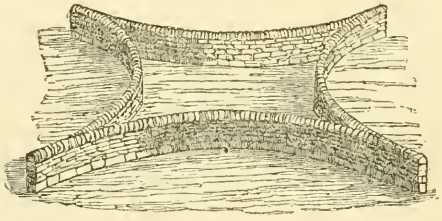
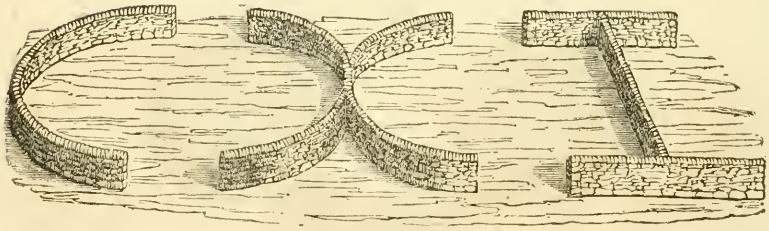


Fig 41.



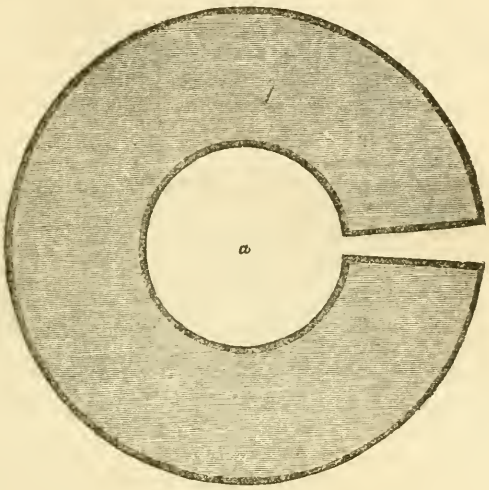
ANCIENT STELLS.

Figures 42 and 43, on the following page, are forms of circular stells, the first made by stone-walls and planting, as in fig. 39. The open space *a* is occupied by the sheep, and *b* is a funnel-shaped opening to it.

On the whole I should consider fig. 42 preferable to any of the preceding forms. Figure 43 represents one of the same form, but without the planting, with a stack in the middle, &c. Either of the stells which are formed in part of trees, would be convenient in severe winds, would form excellent shades in summer, and would constitute highly ornamental objects on the farm, and in the landscape. On the most northerly of the Southern mountains, where considerable snow falls, they might even be good contrivances for winter shelter. They might also be convenient on the lowlands farther south, provided the shelter of evergreens could be made dense enough to protect the sheep from the winter *rains*. In this case, the stell or covert might be of any shape, and ought to have no cen

tral opening. It would be merely a dense clump of evergreen trees, for the sheep to take refuge under in storms of rain, and it might be surrounded on the outside with a tight board fence or stone-wall, if much exposed

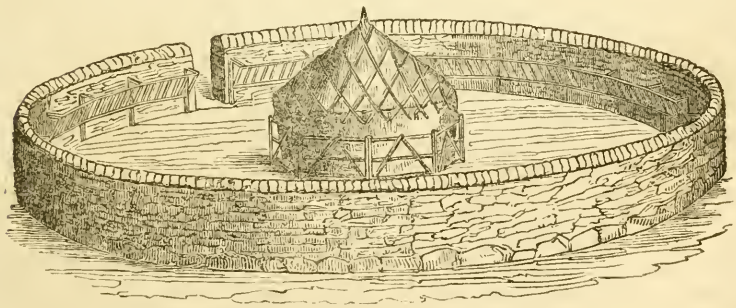
Fig. 42.



THE INSIDE CIRCULAR STELL.

to the sweep of cold winds. As the sheep would lie among the trees, a clump 50 or 60 feet in diameter—though 100 feet would be better—would suffice for 100 sheep.

Fig. 43.



THE CIRCULAR STELL FITTED UP WITH HAY-RACKS.

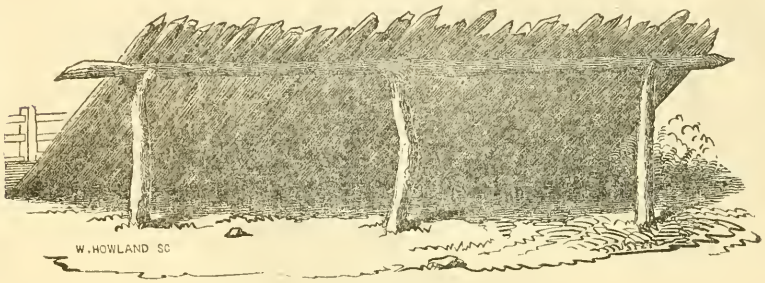
But in determining upon the best winter shelters, for the various regions in the South, the fact must not be lost sight of that *cold rains*, or rains of any temperature, *when immediately succeeded by cold or freezing weather, or cold, piercing winds*, are more hurtful to sheep than even snow-storms—and that consequently sheep must be adequately guarded against them. There must also be suitable shelter from *any* storms to which the country is subject, *in the lambing season*. Any person with the least experience can determine whether an inclosed clump of trees will answer these purposes, in his own immediate region.

I think it very probable that in the Gulf States, and some of the lower Atlantic ones—particularly in regions near the ocean—these tree coverts,

surrounded by fences to break the winds, would be found sufficient. In sections infested with wolves, they might also be made to answer for *folds*, by carrying the fence to the requisite hight, to bar the ingress of the wolf. But farther north, and on the high lands and mountains, better shelters would, I am inclined to think, in the end, be found more economical.

The simplest and cheapest kind of shed is represented in the following cut (fig. 44). It is formed by poles or rails, the upper ends resting on a strong horizontal pole supported by crotched posts set in the ground. It may be rendered rain-proof by pea-haulm, straw, or pine boughs.

Fig. 44.



SHED OF RAILS.

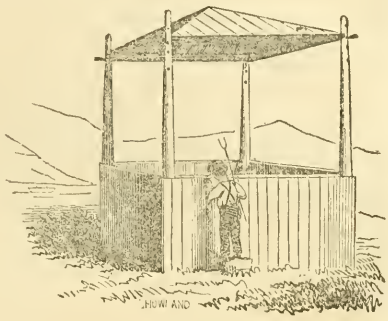
In a region where lumber is very cheap, planks or boards (of sufficient thickness not to spring downward and thus open the roof) battened with slabs, may take the place of the poles and boughs; and they would make a tighter and more durable roof. If the lower ends of the boards or poles are raised a couple of feet from the ground, by placing a log under them, the shed will shelter more sheep.

These movable sheds may be connected with hay-barns, "hay-barracks," stacks, or they may surround an inclosed space with a stack in the middle like fig. 43. In the latter case, however, the yard should be *square*, instead of *round*, on account of the divergence in the lower ends of the boards or poles, which the round form would render necessary.

Sheds of this description are frequently made, in the North, between two stacks. The end of the horizontal supporting pole is placed on the stack-pens, when the stacks are built, and the middle is propped by crotched posts. The supporting-pole may rest, in the same way, on the upper girts of two hay-barracks; or two such sheds (at angles with each other) might form wings to this structure. The "barrack," as it is provincially termed in the North, would, it strikes me, afford a most economical and a most convenient way of storing fodder in the South. It is easily movable, so that it possesses the same advantage that stacks do, in manuring different parts of the field or farm. On the other hand, the fodder cannot be drenched by a winter rain, as in a partly fed out stack. Hay can be more rapidly stored in it than on a stack at any time, and you can pitch into it to the last moment, when threatened with rain, without stopping to round up the top as is necessary in a stack. The outside is not weather-beaten and damaged, as is the case with the sides, and frequently with a considerable of the top of a stack. Fig. 45 (on the next page) represents the form of a barrack. It is 12 feet square on the bottom, and the frame is formed by girting together four strong poles, 16 feet long, at the bottom, and 6 feet from the bottom. Boards 6 feet long are nailed perpendicularly on the girts. Two-inch holes are bored at convenient distances through the corner poles, so that the roof, which rests

on pins thrust through these holes, can be raised or lowered, at pleasure. It is occasionally lowered as the fodder gets lower in the barrack, so that rain or snow shall not drive under it. It seems to me that this structure would be remarkably well adapted to the storing and feeding out of unthreshed peas, which, as has been remarked in a former Letter, are so advantageously raised at the South, and constitute so admirable a feed for sheep.

Fig. 45.

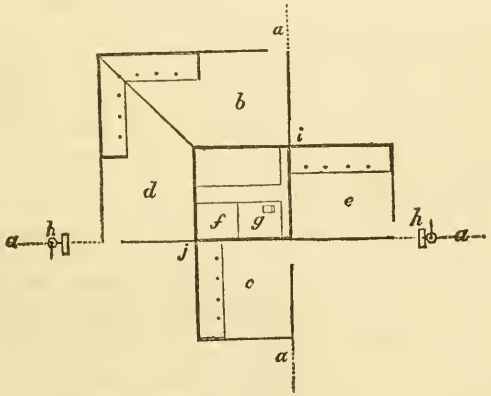


BARRACK.

On all large sheep-farms convenience requires that there be one barn of considerable size, to contain the shearing-floor, and the necessary conveniences about it for yarding the sheep, &c. This should also, for economy, be a hay-barn, (where hay is used,) and from its necessary size (for the shearing-floor), it should hold hay for 400 sheep. It may be constructed in the corner of four fields, so that four hundred sheep can be fed from it, without making improperly sized flocks. At this barn it would be expedient to make the best shelters, and to bring together all the breeding-ewes on the farm, if their number did not exceed 400. Thus the shepherd would be saved much travel at all times, and particularly at the lambing-time, and each flock would be under his almost constant supervision.

I offer the following ground-plan of a barn with fixtures, &c., as one which I think will be found well adapted to the purpose above specified. The upper is the north part of the plan.

Fig. 46.



The dotted lines a, a, a, a, are the fences dividing four fields, which would corner at the south-east corner of the barn. The barn is surrounded by double lines, and the sheds by double lines on the backs and ends—the dots in front of them, representing the crotched posts supporting their front. The single black lines round the yards, represent tight board fences, which screen the four yards b, c, d, e, from every wind. There are two pumps and troughs at h, h, which accommodate the whole four fields, if a want of springs or streams in them render these necessary. The sheds are so ar-

ranged that even without the screens they entirely shut out the north and west winds—the prevailing and severe winter ones of *this* region—and if other ones are more prevalent in other regions, the sheds can be changed accordingly. Each of the sheds is 50 feet long and 12 feet wide—six square feet being the smallest *proper* allowance of sheltered area for each sheep. The barn is 48 feet square, a floor 13 feet wide running east and west through the center, for shearing and for the drawing in of hay. An alley 4 feet wide and 8 feet high (boarded up on the side toward the mow, and covered at the top) cuts off the lower part of each bay from the east wall of the barn. This is for carrying hay into the yards *b*, *c*. It is carried into the yards *d*, *e*, from the large doors at each end of the shearing-floor (or from smaller ones cut through them.) The south bay is represented as divided by a temporary fence, cutting it into two pens *f*, *g*. The outside inclosure *c*, for yarding the sheep, communicating by a door with *f*, and *g* being used as a room to tie up wool in, presents precisely the same arrangement which is exhibited in the cut of the shearing-barn (fig. 22) in Letter XII.

The barn here given (fig. 46) is probably larger than would be necessary for 400 sheep, in most parts of the South. Its necessary size is a question to be entirely determined by the climate. For large flocks of sheep, I should regard the storage of *some* hay or other fodder for winter as an indispensable *precautionary* measure, at least, in *any* part of the United States; and, other things being equal, the farther north, or the more elevated the land, the greater would be the necessary amount to be stored.

The shearing-floor shortened to 30 or 35 feet, would still, perhaps, be sufficiently commodious, and this would reduce the dimensions of the barn east and west 13 or 18 feet; and one of the bays might be dispensed with. But having constructed so large, so smooth, and so tight a barn-floor as the shearing one ought to be, it would be good economy to use it for the threshing of grain. One of the bays, therefore, might be used for the storage of grain in the sheaf. I have always considered this an excellent arrangement in a *Northern* barn of this description, as in our cold climate the sheep require much straw litter in their sheds, yards, &c. Thrown out to them daily, as threshed, much bright straw and chaff will be consumed by them—particularly of greenish cut oats.

The yards *c*, *e*, in fig. 46 are represented but the width of the barn, 48 feet. If these were reduced too much, by diminishing the size of the barn, the shed of *c* could be carried farther west at *j*, and that of *e* farther north at *i*, being connected with the barn by wind-breakers, composed of a tight board fence, as high as the summit of the sheds. Or, what would perhaps be better, the fences thrown forward in a straight line from the *ends* of these two sheds might be continued until they intersected each other, and a fence from their point of intersection to the south-east corner of the barn would divide the two yards.

Feeding Sheep with other Stock.—Sheep should not run or be fed, *in yards*, with any other stock. Cattle hook them, often mortally. Colts tease and frequently injure them. It is often said that "colts will pick up what sheep leave." Well-managed sheep rarely leave anything—and if they chance to, it is better to rake it up and throw it into the colts'yard, than to feed them together. If sheep are not required to eat their feeds pretty clean, they will soon learn to waste large quantities. But if sheep are overfed with either hay or grain, it is not proper to compel them by starvation to come back and eat it. They will not unless sorely pinched. Clean out the troughs,—or rake up the hay, and the next time feed less.

HAY-HOLDERS.—Where hay or other fodder is thrown out of the upper doors of a barn into the sheep-yard, as it always must necessarily be in a barn constructed like fig. 38, or any *mere hay*-barn, or where it is thrown from a barrack or stack, the sheep immediately rush on it, trampling it and soiling it, and the succeeding forkfulls fall on their backs, filling their wool with dust, seed and chaff. This is avoided by hay-holders—yards 10 feet square—either portable by being made of posts and boards, or simply a pen of rails, placed under the doors of the barns, and by the sides of each stack or barrack. The hay is pitched into the holder, in fair weather enough for a day's foddering at a time, and is taken from this by forkfulls and placed in the racks. I would here offer a necessary caution in relation to the use of *rails* or *poles*, for stack-pens or hay-holders. The poles should be so small as to entirely prevent the sheep from inserting their heads between them after hay. A sheep will often insert its head where the opening is wide enough for that purpose, shove it along or get crowded along, to where the opening is not wide enough to withdraw the head, and it will hang there until observed and extricated by the shepherd. If, as it often happens, it is thus caught when its fore parts are elevated by climbing up the side of the pen, it will continue to lose its fore footing in its struggles, and will soon choke to death.

WINTER DRY FEED FOR SHEEP.—The proper dry winter fodder for sheep has already been repeatedly alluded to, in general terms. Volumes have been expended on this subject, particularly in Germany—and curious and elaborate systems of feeding given. In Germany great stress is laid on *variety* in the winter fodder. In the German Farmer's Encyclopædia, the following table of the proper variations and amounts of feed is given by PETRI.

TABLE 15.

Day.	Lbs.	Loth, equal ½ oz.	Morning.	Lbs.	Loth, equal ½ oz.	Noon.	Lbs.	Loth, equal ½ oz.	Evening.
1		21	hay		21	hay		21	hay
2	1	1	rye straw	1	22	hay	1	1	rye straw
3		23	bean straw		26	vetch-hay		23	bean straw
4	1		wheat straw	1		sainfoin	1		wheat straw
5	1	6	oat straw		21	hay	1	6	oat straw
6	1	6	artichoke stalk	1	19	red clover	1	6	artichoke stalk
7	1	8	turkey wheat	1	12	lucern	1	8	turkey-wheat str'w
8	1	8	buckwheat straw	1	16	hay	1	8	buckwheat straw
9	1	6	oat straw		7	horse-beans	1	6	oat straw
10		19	red clover		19	red clover		19	red clover
11		18	sainfoin		18	sainfoin		18	sainfoin
12	1	6	millet straw	1	6	millet straw	1	6	millet straw
13		30	lentil straw		21	hay		30	lentil straw
14		30	pea straw		21	hay		30	pea straw
15		30	barley straw	1		artichoke stalk		30	barley straw
16	1	10	horse-bean straw	1	10	horse-bean straw	1	10	horse-bean straw
17	1	1	rye straw	1	11	oat straw	1	1	rye straw
18	1	3	wheat straw	1	9	oat straw	1	3	wheat straw
19	1	6	rye straw	1		turkey-wheat	1	3	wheat straw
20	1	6	oat straw	1		turkey-wheat	1	6	oat straw
21	1	3	wheat straw		22	artichoke stalk	1	6	oat straw
22		30	lentil straw	1	30	vetch straw		30	lentil straw
23	1	6	oat straw	1	6	wheat straw	1	6	oat straw

The same writer gives the following as the proper winter feed of a ewe, the month preceding lambing :

TABLE 16.

1st day..	In the morning,	¾ lb.	of good oat straw.
	.. noon	½ ..	of good hay of clover.
	.. evening..	¾ ..	of good barley straw.
2d day ..	.. morning ..	¾ ..	of millet straw.
	.. noon	2 ..	of potatoes with 4 oz. of chopped straw, and 4 oz. of oats.
	.. evening..	¾ ..	of barley straw.
3d day ..	.. morning ..	¾ ..	of hay.
	.. noon	½ ..	of hay,
	.. evening..	1 ..	of wheat, oat, barley or buckwheat straw.
4th day..	.. morning ..	¾ ..	of summer straw.
	.. noon	½ ..	of chopped straw, with 3 oz. oats and 3 oz. bran, moistened with water.
	.. evening..	¾ ..	of winter straw.
5th day..	.. morning ..	¾ ..	of hay.
	.. noon	2 ..	of potatoes with ½ lb. of chopped straw.
	.. evening..	¾ ..	of winter straw.
6th day..	.. morning ..	¾ ..	of hay.
	.. noon	as in 4th day,	
	.. evening..	1 lb.	of straw.

All this would be infinitely "more nice than wise," in any part of the United States. Variations of dry fodder are well enough, but hundreds and thousands of Northern flocks receive nothing but ordinary hay, consisting mainly of Timothy, *(Phleum pratense,)* some Red and White Clover, *(Trifolium pratense et repens,)* and frequently a sprinkling of June or Spear grass, *(Poa pratensis,)* during the entire winter. Others receive an occasional fodder of corn-stalks and straw—and some farmers give a daily feed of grain through the winter. Where hay is the principal feed, it may be well, where it is convenient, to give corn-stalks (or "blades") every fifth or sixth feed, or even once a day. Or the daily feed, *not of hay*, might alternate between blades, pea-straw, straw of the cereal grains, &c. Should any other fodder besides hay be the principal one, as, for example, corn-blades or pea-haulm, each of the *other* fodders might be alternated in the same way. It is mainly, in my judgment, a question of convenience with the flock-master, provided a *proper supply of palatable nutriment within a proper compass*, is given. Hay, clover, properly cured pea-haulm, and corn-blades are palatable to the sheep, and each contain the necessary supply of nutriment in the quantity which the sheep can readily take into its stomach. Consequently, from either of these, the sheep can derive its entire subsistence. The same remarks *may*, possibly, apply to greenish cut oat and barley straw; but it would not, I apprehend, be economical or altogether safe to *confine* any kind of sheep to the *straw* of the cereal grains unless some of those little hardy varieties of sheep which would be of no value in this country. Experiment will readily show the flock-master what kinds of food are palatable and agree with the health of his flock. The following exceedingly valuable Table, prepared by Boussingault, will give the value of various kinds of feed in comparison with ordinary natural meadow hay, as ascertained by himself, Von Thaër, Block, and other distinguished Agricultural Chemists. The results are obtained by chemical analysis, and by actual experiments in feeding. The amount of nitrogen in 100 parts is made the chemical test of value, as it shows the quantity of fibrin, albumen, and casein, (by multiplying by 6.3.) The experimental result is obtained by weighing the animal and the feed, and giving him enough of each to maintain him in good condition.

TABLE 17.

FODDERS.

TABLE OF THE NUTRITIVE EQUIVALENTS OF DIFFERENT KINDS OF FODDERS.

Kinds of Food.	Standard water per cent.	Nitrogen per cent.	Nitrogen per cent. in the article not dried.	Theory.	Block.	Petri.	Meyer.	Thaer.	Pabst.	Remarks.
Ordinary natural meadow hay	14.0	1.34	1.15	100	100	100	100	100	100	
Do. of fine quality	14.0	1.50	1.30	98						
Do. select	18.8	2.40	2.00	58						
Do. freed from woody stems	14.0	2.44	2.10	55						
Lucern hay	16.6	1.66	1.38	83		90		90	100	90, 90 Dombasle,
Red clover hay, 2d year's growth	10.1	1.70	1.54	75	100	90		90	100	[Crud.
Red clover cut in flower, green, do.	76.0		0.64	311	430			450	425	
New wheat straw, crop 1841	26.0	0.36	0.27	426	200	360	150	450	300	500 Rieder.
Old wheat straw	8.5	0.53	0.49	235						
Do. do. lower parts of the stalk	5.3	0.43	0.41	280						
Do. do. upper part of do. and ear	9.4	1.42	1.33	86						
New rye-straw	18.7	0.30	0.24	479	200	500	150	666		
Old do	12.6	0.50	0.42	250						
Oat-straw	21.0	0.36	0.30	383	200	200	150	190	200	400 Schwertz.
Barley do	11.0	0.30	0.25	460	193	180	150	150	200	400 do.
Pea do	8.5	1.95	1.79	64	165	200	150	130	150	90 Pohl.
Millet do	19.0	0.96	0.78	147		250				
Buckwheat do	11.6	0.54	0.48	240		200				
Lentil do	9.2	1.18	1.01	114	160	200		130	150	
Vetches cut in flower and dried into hay	11.0	1.16	1.14	101		125			100	
Potato tops	76.0	2.30	0.55	209		300				
Field-beet leaves	88.9	4.50	0.50	230	600				600	
Carrot do	70.9	2.94	0.85	135						
Jerusalem artichoke stems	86.4	2.70	0.37	311					325	
Lime-trees, young shoots	55.0	3.25	1.45	79	73					
Canada Poplar do	62.5	2.29	0.86	134	67					
Oak do	57.4	2.16	0.92	125	83					
Acacia do. (autumn)	53.6	1.56	0.72	161						
Drum cabbage	92.3	3.70	0.28	411	556	500	250	429	600	
Swedish turnip	91.0	1.83	0.17	676		300		300	250	
Turnip	92.5	1.70	0.13	885	533	600	290	526	450	
Field-beet (1838)	87.8	1.70	0.21	548	366	400	250	460	250	
Do. white Silesian	85.6	1.43	0.18	669	366					
Carrots	87.6	2.40	0.30	382	205	250	225	300	250	380 Boussingault.
Jerusalem artichokes (1839)	79.2	1.60	0.33	348						280 do.
Do. (1836)	75.5	2.20	0.42	274						
Potatoes (1838)	65.9	1.50	0.36	319	216	200	150	200	200	280 Boussingault.
Do. (1836)	79.4	1.80	0.37	311						
Do. after keeping in the pit	76.8	1.18	0.30	383	400					
Cider apple pulp dried in the air	6.4	0.63	0.59	195						
Beet-root from the sugar mill	70.0		0.39	303						
Vetches in seed	14.6	5.13	4.37	26	30	54		66	40	
Field-beans	7.9	5.50	5.11	23	30	54	50	73	40	
White peas (dry)	8.6	4.20	3.84	27	30	54	48	66	40	
White haricots	5.0	4.30	4.58	25		39				
Lentils	9.0	4.40	4.00	29						
New Indian Corn	18.0	2.00	1.64	70		52				59 Boussingault.
Buckwheat	12.5	2.40	2.10	55		64				
Barley (1836)	13.2	2.02	1.76	65	33	61	53	76	50	
Barley-meal	13.0	2.46	2.14	54						
Oats (1838)	20.8	2.20	1.74	68		71		86	60	
Do. (1836)	12.4	2.22	1.92	60						
Rye (1838)	11.5	2.27	2.00	58						
Wheat (1836, Alsace)	10.5	2.33	2.09	55	27	52	46	64	40	
Do. from highly manured soil	16.6	3.18	2.65	43						
Recent Bran	37.1	2.18	1.36	85	105					Some specimens are twice as rich.
Wheat husks or chaff	7.6	0.94	0.85	135	160					
Rice (Piedmont)	13.4	1.39	1.20	96						
Gold of Pleasure aced (Madia)	8.0	4.00	3.67	31						
Do. cake	11.2	5.70	5.06	23						
Linseed cake	13.4	6.00	5.20	22	42	180				
Colza do	10.5	5.50	4.92	23						
Madia do	6.5	5.93	5.51	21						
Hemp do	5.0	4.78	4.21	27						
Poppy do	6.8	5.70	5.36	21						
Nut do	6.0	5.50	5.24	22						
Beech-mast do	6.2	3.53	3.31	35						
Arachis (Pindars) do	6.6	8.80	8.33	14						
Dry acorns			0.80	143						
Refuse of the wine-press, air-dried	48.2	3.31	1.71	68		62			75	

The great value of pea-haulm, as shown in the above Table, is worthy of the particular notice of the Southern flock-master. Also that of millet straw, another crop peculiarly congenial to the Southern States, provided it can be cured so that sheep will eat it. Corn-stalks are not, unfortunately, included in the Table. According to Petri, 100 *pounds* of corn "straw," (including *stalks* and *leaves*, I suppose,) contains but $\frac{2}{5}$ as much nutriment as the same weight of "aromatic meadow hay," and not so much by $\frac{1}{5}$ as an equal weight of oat or pea straw, which *he* makes *equivalent* to each other! My opinion is that this by no means indicates the comparative value of *well cured* corn-stalks. No analysis of them now occurs to me, in any authority which I have on hand. Mr. Ellsworth, of the Patent Office, stated in the Cultivator in 1842, that the *juice* of corn-*stalks*, on Beaumé's Saccharometer, is equal in saccharine matter with that of the cane in this country, five times greater than that of the Northern sugar-maple, *(Acer saccharinum,)* and three times that of beet! The daily experiments of our farmers demonstrate the absurdity of placing corn-stalks below the value of the cereal straws. Cured green and bright they are a highly valuable fodder, and are relished by all herbivorous animals. My friend, James M. Ellis, Esq. of Onondaga, N. Y., one of the best managing flock-masters of this State, has fed corn-stalks largely to his sheep for several years and with decided succes.

—

Effect of Food in the Production of Wool.—The fact has been before alluded to that well fed sheep produce more wool than poorly fed ones. The question now arises—if the effect on the condition (flesh) of the sheep is the same, will one kind of food produce more wool than another? No doctrine is more clearly recognized in Agricultural Chemistry, than that animal tissues derive their chemical components from the same components existing in their food.* The analyses of Liebig, Johnston, Scherer, Playfair, Boeckmann, Mulder, &c., show that the chemical composition of wool, hair, hoofs, nails, horns, feathers, lean meat, blood, cellular tissue, nerves, &c. are nearly identical. The organic part of wool, according to Johnston,† consists of carbon 50.65, hydrogen 7.03, nitrogen 17.71, oxygen and sulphur 24.61. The inorganic constituents are small. When burned, it leaves but 2·0 per cent of ash. The large quantity of nitrogen (17.71) contained in wool, shows that its production is increased by highly azotized food. This is fully verified by the experiments made on Saxon sheep, in Silesia, by Reaumur, whose Table I append. A striking correspondence will be found to exist between the amount of wool and the amount of nitrogen in the food.

TABLE 18.

Kinds of food.	Increase of weight in live animal.	Produced wool.		Produced tallow.		Nitrogen per cent. in food.
		lbs.	oz.	lbs.	oz.	
1000 pounds of raw potatoes, with salt	46½	6	8¾	12	5½	0.36
1000 " " without salt	44	6	8	10	14½	0.36
1000 " raw mangel-wurzel	38	5	3½	6	5½	0.21
1000 " pease	134	14	11	41	6	3.83
1000 " wheat	155	13	13½	59	9	2.09
1000 " rye, with salt	90	13	14½	35	11½	2.00
1000 " rye, without salt	83	12	10½	33	8½	2.00
1000 " oats	146	9	12	40	8	1.70
1000 " barley	136	11	6½	60	1	1.90
1000 " buckwheat	120	10	4½	33	8	2.10
1000 " good hay	58	7	10½	12	14	1.15
1000 " hay, with straw, without other fodder	31	15	8	6	11	
1000 " whisky, still-grains or wash	35	6	1	4	0	

* For full information on this whole subject, see Liebig's Animal Chemistry, Part I and II.

† See Johnston's Agricultural Chemistry—Lecture XVIII. Analyses of the horny tissues, by Scherer, will be found in the Appendix to Liebig's Animal Chemistry.

The singular difference stated in the Table, between the amount of wool produced by "good hay," and "hay with straw without other fodder," I confess is scarcely credible to me. It may be a misprint in the Table from which I copy.

The peculiar value of pease not only in increasing the wool, where they rank *first*,* but in the average comparative increase which they produce in *all* the tissues, is again worthy of notice.

—

Effect of Food in producing Fat and Muscle.—The increase of fat and muscle, as of wool, depends upon the nature of the food. It would be foreign from my purpose to enter into an elaborate theoretical examination of this subject. Liebig, in Parts I. and II. of his Animal Chemistry, has covered the whole ground, and to him I take the liberty to refer you. Mr. Spooner, writing for England, where the production of flesh and fat is the primary object of Sheep Husbandry, has given a synopsis of Liebig's positions, analyses, &c., in his chapter (XXI.) on Feeding and Fattening—and the substance of this is again repeated by Mr. Morrell in his chapters on the same subjects, in The American Shepherd. To either of the latter I would refer you for *sufficient* details for practical purposes, or for *full* information, to Liebig.

The Tables of Boussingault and Reaumur, already given, (Tables 17 and 18,) sufficiently indicate the value of the various grains, straw, roots, &c., in fattening.

It is not very common, in the North, for *wool-growers* to fatten their wethers, for market, by extra winter feeding. Some give them a little more generous keep the winter before they are to be turned off, and then sell them when they have attained their maximum fatness the succeeding fall. When winter fattening is attempted, sheep require warm, dry shelters, and should receive, in addition to all the hay they will eat, meal twice a day in troughs—or meal once and chopped roots once. The equivalent of from half a pint to a pint of (yellow) corn meal per head per diem is about as much as ordinary flocks of Merino wethers will profitably consume, though in selected flocks consisting of large animals, this amount is frequently exceeded.

—

Feeding Grain to Store-Sheep in Winter.—The expediency of feeding grain to store-sheep in winter depends much upon circumstances. If in a climate where they can obtain a proper supply of grass or other green esculents, it would, of course, be unnecessary. Neither is it a matter of *necessity* where the ground is frozen or covered with snow for weeks or months, provided the sheep be supplied plentifully with *good* dry fodder. Near markets where the coarse grains find a good and ready sale, it is not usual in the North, to feed grain. Remote from markets, it is generally fed by the holders of large flocks. Oats are commonly preferred, and they are fed at the rate of a gill a head per day. Some feed half the same amount of (yellow) corn. Fewer sheep—particularly lambs, yearlings, and crones—get thin and perish, where they receive a daily feed of grain; they consume less hay; and their fleeces *are increased in weight.* On the whole, therefore, it is considered good economy. Where no grain is fed, three daily feeds of hay are given. It is a common and very good practice to feed greenish cut oats *in the bundle*, at noon, and give but two feeds of hay—one at morning and one at night. A few feed greenish cut peas in the same way. In warm, thawing weather when sheep get

* With the exception of "hay and straw"—the given product of which, in wool, I have already stated must undoubtedly be misprinted.

to the ground, and refuse dry hay, a little grain assists materially in keeping up their strength and condition. This may furnish a useful hint for many parts of the South. When the feed is shortest in winter, in the South, there are many localities where sheep would get enough grass to take off their appetite for dry hay, but not *quite* enough to keep them in prime condition. A moderate daily feed of oats or pease placed in the depository racks, would keep them strong, in good plight for the lambing season, and increase their weight of wool.

Few Northern farmers feed Indian corn to store-sheep. It is considered "too hot and stimulating," and sheep are thought to be more liable to become "cloyed" on it than on oats, pease, &c. I never have fed it to sheep sufficiently to speak advisedly on this point. A neighboring flock-master whose admirable arrangements for keeping sheep are only equaled by his usual success, lost most of a large flock of lambs a few winters since. They received all they would eat of the best hay, and, as the owner *supposed*, a half gill of corn a head per day. They were in fine order in the beginning, and for some time into the winter. During a thaw, when they got a little off from their feed, and looked "hollow," the shepherd, without the knowledge of the owner, increased the feed of corn. This caused them to eat still less hay, and the shepherd not only continued but increased the allowance of the corn as their appetite for hay diminished. In a short time they ate scarcely any hay, and soon after began to eat their corn very irregularly. Their stomachs were now so completely deranged, that they would not eat *anything*, in quantities sufficient for their subsistence, and they perished rapidly and miserably. The same consequences might doubtless have ensued from feeding *other grains*, in the same improper manner. But I am inclined to think that the evil would have been less rapid and remediless with some other grains. I do *not* consider yellow corn a very safe feed, at least for lambs and yearlings. From the obviously different character of the larger Southern varieties, I presume they would be less, and very probably not at all, objectionable for sheep feed. Half a gill of yellow corn, or a gill of oats per head, is a sufficient daily allowance of grain. While there can be nothing more absurd than the German *starving* system to increase the fineness of the wool, excessive fatness is not to be aimed at, especially in breeding-ewes. Store sheep should be kept in good, fair, *plump* condition. Lambs and yearlings may be as fat as they will become on *proper feeding*.

It will not do to suffer sheep to get thin in the winter, with the idea that their condition can at any time be readily raised by better feed, as with the horse or ox. It is always difficult, and unless properly managed, expensive and hazardous, to attempt to raise the condition of a poor flock in the winter—especially if they have reached that point where they manifest *weakness*. If the feeding of a liberal allowance of grain be suddenly commenced, fatal diarrhea will frequently supervene. All extra feeding, therefore, must be begun very gradually, and it does not seem, in any case, to produce proportionable results.

I have seen it stated that sheep will eat cotton-seed and thrive on it. If this be true, this must, of course, be a far more remunerating application of that product, than as a mere *manure* to soils.

Feeding Roots, Browse, &c., in Winter.—Ruta-bagas, Irish potatoes, &c., make a good substitute for grain, as an extra feed for grown sheep. I prefer the ruta-baga to the potato in equivalents of nutriment. I do not consider either of them, or any other root, as good for lambs and yearlings as an equivalent in grain. Sheep may be *taught* to eat nearly all the cul-

tivated roots. This is done by withholding salt from them, and then feeding the chopped root a few times rubbed with just sufficient salt to induce them to eat the root to obtain it; but not enough to satisfy their appetite for salt before they have acquired a taste for the roots.

It is customary with some of our flock-masters to cut down from time to time, in the winter, and draw into the sheep-yards, young trees of the hemlock *(Abies canadensis)*. The foliage is greedily eaten by sheep, after being confined for some time to dry feed. I have known sheep, undoubtedly, I think, killed by overeating it. This browse is commonly used for some supposed medicinal virtues. It is pronounced "healthy for sheep." The popular supposition is that it is a tonic and stimulant. If this be true, which I will not pause to inquire, of what *good* use are tonics and stimulants to *healthy* animals? With sheep, as with horses, and even with men, *preventive* medicines are productive of injury in a thousand cases, where they are of benefit in one. There could be no objection, certainly, to sheep's eating the foliage of the hemlock, if it was constantly accessible to them. Their instincts, in that case, would teach them whether, and in what quantities, to devour it. But when entirely confined to dry feed for a protracted period, sheep will consume hurtful and even poisonous succulents—and of the most wholesome ones, hurtful *quantities*. As a mere *laxative*, an occasional feed of hemlock may be beneficial; but in this point of view, a day's run at grass in a thaw, or a feed of roots, would produce the same result. In a climate where grass is obtained most of the time, I should consider browse for medicinal purposes entirely unnecessary.

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Winter Feed of Breeding-Ewes.—Until two or three weeks preceding lambing, it is only necessary that breeding-ewes, like other store-sheep, be kept in good plump ordinary condition. Nor are any separate arrangements necessary for them, after that period, in a climate where they obtain sufficient succulent food to provide for a proper secretion of milk. In backward seasons in the North, where the grass does not start prior to the lambing time, careful flock-masters feed their ewes chopped roots, or roots mixed with oat or pea meal. This is, in my judgment, excellent economy.*

—

Regularity in Feeding.—If there is one rule which may be considered more imperative than any other in Sheep Husbandry, it is that the utmost regularity be preserved in feeding. First, there should be regularity as to the *times* of feeding. However abundantly provided for, when a flock are foddered sometimes at one hour and sometimes at another—sometimes three times a day and sometimes twice—some days grain and some days none—*they cannot be made to thrive.* They will do far better on *inferior keep*, if fed with strict regularity. In a climate where they require hay three times a day, the best times for feeding are about sunrise in the morning, at noon, and an hour *before dark* at night. Unlike cattle and horses, sheep do not eat well *in the dark*, and therefore they should have time to consume their feed before night sets in. Noon is the common time for feeding grain or roots, and is the best time if but two fodderings of hay are given. If the sheep receive hay three times, it is not a matter of much consequence with which feeding the grain is given, only that the practice be uniform.

It is also highly essential that there be regularity preserved in the *amount* fed. The consumption of hay will, it is true, depend much upon the

* For the effect of the various esculents on the quantity and quality of the milk, see Liebig's Animal Chem.

weather. The keener the cold, the more sheep will eat. In the South much would also depend upon the amount of grass obtained. In many places a light daily foddering would suffice—in others, a light foddering placed in the depository racks once in two days would answer the purpose. In the steady cold weather of the North, the shepherd readily learns to determine about how much hay will be consumed before the next foddering time. And this is the amount which should, as near as may be, be *regularly* fed. In feeding grain or roots there is no difficulty in preserving *entire regularity*, and it is vastly more important than in feeding hay. Of the latter a sheep will not overeat and surfeit itself. Of the former it will. And if not fed grain to the point of surfeiting, but still over-plenteously, it will expect a like amount at the next feeding, and failing to receive it, will pine for it and manifest uneasiness. The effect of such irregularity on the stomach and system of *any* animal is bad—and the sheep suffers more from it than any other animal. I would much rather that my flock receive no grain at all, than that they receive it without regard to regularity in the amount. The shepherd should be required to *measure* out the grain to sheep in all instances—instead of *guessing* it out—and to measure it to each separate flock.

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Salt.—Sheep undoubtedly require salt in winter. Some salt their hay when it is stored in the barn or stack. This is objectionable, as you thus constitute yourself the judge, or controller in a matter, where the appetite of the sheep is a much safer guide. It may be left accessible to them in the salt-box (fig. 28) as in summer, or it is an excellent plan to give them an occasional feed of brined hay or straw. This last is done in warm thawing weather, when their appetite is poor, and thus serves a double purpose. With a wisp of straw sprinkle a thin layer of straw with brine—then another layer of straw and another sprinkling, and so on. Let this lie until the next day, for the brine to be absorbed by the straw, and then feed it to all the grazing animals on the farm which need salting.

—

Water.—Unless sheep have access to succulent food or clean snow, water is indispensable. *Constant* access to a brook or spring is best, but in default of this, they should be watered, at least *once a day*, in some other way.

Preservation of Peach-Trees from the Attack of Borers.—As the best method of preventing the destruction of peach-trees by borers is a matter of public interest, in different sections of the country, I will give my plan of preventing their ravages in young trees, and for expelling them from old ones. I ascertained several years ago that sulphur is more offensive to most kinds of insects than any other substance with which I was acquainted. When applied to fruit-trees it lasts longer and is more permanent in its operation than anything I have tried. Peach-trees are often attacked by the worm in the nursery, which may easily be known by a blackish appearance, with exuded gum on the stem near the ground and on the roots. When the young trees are taken from the nursery, for transplanting, they must carefully be examined and the worms removed with a long brad-awl, or a knife. Then rub over their upper roots and about six inches of the lower part of their stems with a mixture of any common oil or grease and the flour of sulphur, well incorporated by stirring. Sprinkle a table-spoonfull of clear sulphur in the bottom of the holes, and then plant the trees in the usual way. In order to expel the borer from old trees, I take a gimlet, or brace and bit, and bore three or four small holes in each tree near the ground, and fill them with flour of sulphur, with the aid of a quill. I also remove the earth from about the roots of the trees, as far as they are attacked by the worms; then apply the mixture of oil and sulphur as directed for young trees, replace the earth, and the process is complete. Both of these modes are cheap, easy in their application, and, as far as I have tried them, have proved effectual.

B. F. Ward.

☞ In dry pasture dig for water on the brow of a hill; springs are more frequently near the surface on a hight than in a vale.

☞ Cows well fed in winter will give more milk in summer.

LECTURES ON BOTANY.*

COURSE OF LECTURES ON BOTANY IN REFERENCE TO AGRICULTURE.

By CHARLES JOHNSON, Esq., *Professor of Botany at Guy's Hospital, &c. &c. At Messrs. Nesbits' Agricultural and Scientific Training School, Kennington Lane, Lambeth, near London.*

LECTURE IV.

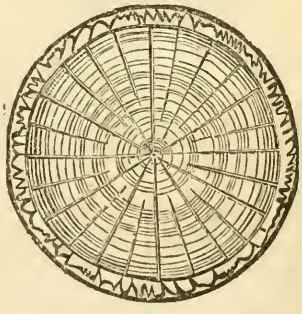
IT has been already remarked that the relative distribution of the minute cells and tubes varies greatly in different plants, and occasions organic differences of vast importance to the investigator of their forms and properties. A very large proportion of the Vegetable Kingdom, numerically considered, consists exclusively of the cell, either simple and separating into as many distinct individuals as there are cells produced by the consecutive partition of its original cavity, according to the mode described in the last Lecture, or the plant assumes in its ultimate growth a stem or leaf-like form, in consequence of the new cells remaining attached and forming a more or less compound structure. These plants, collectively called *cellular*, are objects of great interest to the naturalist, and furnish examples of vegetable development that are not without their value in the elucidation of that of the higher orders. In the economy of Nature, too, they are agents ever active and efficient. The sea-weed, the lichen, the moss, and the fungus, constitute no unimportant links of the vast chain of organic existence; but being for the most part beyond the pale of cultivation, any extended notice of their individual structure and characters would be incompatible with our present subject; and I shall therefore now only observe that, with the exception of the last, subsisting chiefly, if not solely, by absorption over their whole surface from the surrounding medium, the vital action is less complicated than in those in which the necessary food imbibed by one set of organs, requires conveyance to others before it can become assimilated or converted into the growing substance of the plant.

The *Lycopodums*, or club-mosses, the *Equisctums*, or horse-tails, and the ferns, constitute a series occupying a middle station between the cellular and the flowering plants; commencing, like the former, with a development simply cellular, they acquire in their ulterior growth the ducts and woody tissue that characterize the latter, to which the presence of stomates in the leaves of the ferns, as shown in our last Lecture, indicates an approach still nearer; the absence of flowers and of distinct spiral vessels being the principal structural differences.

The influence, direct and indirect, of these flowerless plants upon the nobler tribes of vegetables is at present little appreciated, or at most only by the philosopher in his silent researches into the secrets of Nature; there are still, however, many points in their history intimately connected with the interests of the practical agriculturist, and that may hereafter come under our discussion, although we must leave them for a time, to pursue that of the structure of their more immediately important associates, the flowering plants.

Although composed of elementary organs of the same denomination, and apparently agreeing in the general phenomena of their growth, so far as previously detailed, flowering plants are distinguishable into two groups or classes, differing in various features, but especially in the structure of their stems or trunks; the tissue or organic substance of which is either chiefly disposed in concentric masses, or is more or less mingled throughout, the tubular with the cellular portion; and from the mode in which its increase takes place under these different circumstances, the former are generally said to be exogens or "outward growers," the latter endogens or "inward growers." The exogens form by far the larger, and perhaps the more important of these two classes in regard to human economy in the aggregate; but the endogens are far from being inferior to them in one respect, and that the most valuable of all—the production of food.

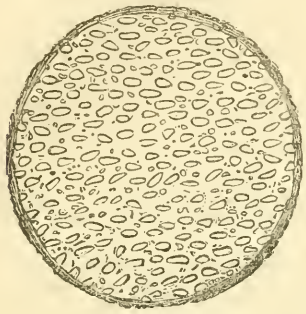
Fig. 1.



SECTION OF EXOGENOUS STEM.

* Continued from page 248, vol. iii. Monthly Journal of Agriculture.

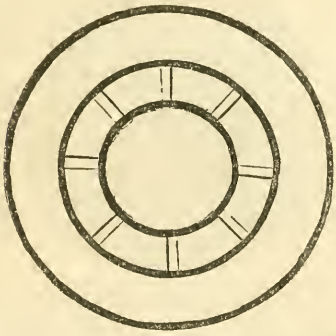
Fig. 2.



SECTION OF ENDOGENOUS STEM.

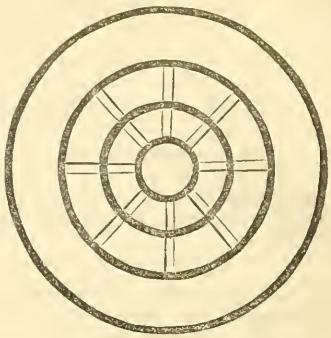
The peculiarity of structure and mode of growth belonging to the exogen will be best observed and understood by examining the development of the trunk and branches of one of our ordinary forest or plantation trees. Commence by dividing, across and longitudinally, a yearling shoot or newly formed branch of either tree or shrub, and you will find its substance disposed in the following manner: The centre is occupied by a column of cellular tissue, the medulla or pith, around this is a cylindrical layer of woody matter, technically called the medullary sheath; and the whole is encompassed by a third portion, consisting chiefly of cellular tissue, the bark of the young branch. The stratification of these parts is evident to the naked eye: their ultimate structure is so minute that it can only be traced by the assistance of the microscope. If we pursue our inquiry farther, we shall find that the veins of the leaves are in direct communication with the medullary sheath; in fact, that they are branches or prolongations of the bundles of spiral vessels and woody fibre which compose it, covered with a continuous extension of the cellular tissue of the bark; while the rudimentary buds in the axils or connecting angles of the leaves and stem, are not only organically connected with the sheath, but contain a projecting portion of the medulla likewise.

Fig. 3.



SECTION OF STEM ONE YEAR OLD.

Fig. 4.



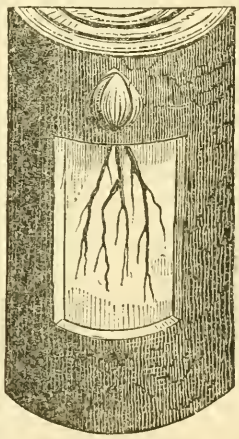
SECTION OF STEM TWO YEARS OLD.

Let us now make similar divisions or sections of the branch from which our yearling shoot proceeds—a similar production to itself, only formed during the preceding summer; yet there is a considerable difference in its structure now: the pith and the medullary sheath remain, but the former has perhaps contracted into half its former compass; its vesicles are no longer turgid, but dry and empty; instead of being regularly formed, they are compressed in various directions; while the latter (the medullary sheath) is scarcely distinguishable from a larger cylinder of woody matter which surrounds and separates it from the bark with which it was previously in contact; the leaves have fallen, and the points of their union with it obliterated, except so far as they are denoted by the development of the buds which they assisted to nourish into branches, the newly formed shoots we have previously examined. The cause of this alteration, and of the greater diameter or thickness of the last year's branch, remains to be explained: before attempting to do so, let us examine a horizontal section of a branch or trunk (for it is immaterial which we take) in a more advanced stage of growth—say of several years, instead of one or two, as exhibited above in fig. 1. Here is the medulla or pith occupying the centre in a still more compressed state, reduced perhaps to a mere point; the sheath is proportionally contracted likewise, owing to the pressure of a great accumulation of later-formed substance around it, viz.: the wood, which, whatever may be its thickness, has been gradually interposed between the medullary sheath and the bark with which it was originally in contact. The wood is seen to consist of many concentric layers or cylinders: each layer consists of a more or less compact mass of woody fibre or sap-vessels, and of ducts, which latter are sometimes distributed throughout the layer, but are more frequently disposed toward the inner face of the woody cylinder to which they appertain. There is another remarkable feature in the wood of all exogenous trees—the presence of what are called medullary rays. In a horizontal sec-

tion they usually present the appearance of so many radii of a circle; they consist of compressed plates of cellular tissue, and extend from the pith in the centre of the trunk or branch quite through the layers of wood to the bark (see fig. 1). Of their office in the economy of the plant we have no positive knowledge, but they probably act as a medium of communication between the outer and inner portions of the trunk, and in the conveyance of those secretions that are eventually deposited in the old or heart-wood of trees. Dr. Lindley very justly observes that these plates or rays "also serve to bind firmly together the whole of the internal and external parts of a stem, and they give the peculiar character by which the wood of neighboring species may be distinguished." "If," he continues, "plants had no medullary rays, their wood would probably be, in nearly allied species, undistinguishable, for we are scarcely aware of any appreciable difference in the appearance of woody or vascular tissue; but the medullary rays (the *silver grain* of the carpenters) differing in abundance, in size, and in other respects, impress characters upon the wood which are extremely well marked. Thus, in the cultivated cherry, the plates of the medullary rays are thin, the adhesions of them to the bark are slight, and hence a section of the wood of that plant has a pale, smooth, homogeneous appearance; but in the wild cherry the medullary plates are much thicker, they adhere to the bark by deep broad spaces, and are arranged with great irregularity, so that a section of the wood of that variety has a deeper color, and a twisted, knotted, very uneven appearance. In *Quercus sessiliflora* (the sessile-fruited oak) the medullary rays are thin, and so distant from each other that the plates of wood between them do not readily break laterally into each other, if a wedge is driven into the end of the trunk in the direction of its cleavage: on the contrary, the medullary rays of *Quercus pedunculatus* (the oak with long-stalked acorns) are hard, and so close together that the wood may be rent longitudinally without difficulty; hence the wood of the latter is the only kind that is fit for application to park paling."

Observation has proved that each concentric layer of which the wood is composed is the produce of a year's growth, insinuated between the next interior layer and the bark. It has likewise enabled us to ascertain the mode in which these successive layers are formed. In the first place, it is proved positively that they are extended in a downward direction: for example, if during the winter we cut away a portion of the bark of a tree or of a branch, so as to form a continuous wound completely surrounding it—a process sometimes performed in gardening, and called *ringing* or *girdling*, from the figure of the wound—in the succeeding spring, soon after vegetation commences, the upper lip of the cut becomes rounded, in consequence of the formation of woody matter above it, while the lower one remains in the same state in which the knife left it; the part likewise above the incision increases sensibly in diameter, the part below does not. The same difference occurs if a wire or ligature be tightly bound round the trunk or branch: the matter therefore which causes its increase descends. Again, if a growing branch be cut through immediately below a leaf or bud, that branch never increased in diameter between the section and the next bud below it; so far, indeed, from doing so, it becomes dead matter. We know also that the greater the number of leaves or leaf-buds developed on any tree during a season, the more does the diameter of its trunk become enlarged. These are circumstances all well known, facts thoroughly ascertained: and from them we are justified in concluding that the successive annual deposits of wood are produced by the growth of the buds; and when to them is added the equally substantiated fact, that in the early spring the incipient or newly forming wood may be traced in the form of roots descending from the bases of the already enlarging buds, the phenomenon of the growth or increase in the wood of exogenous trees is explained as satisfactorily as the present state of human Science admits.

Fig. 5.



WOODY FIBRE DESCENDING FROM BASE OF GROWING BUD.

The variegated lines and spots, which constitute the chief beauty of wood when manufactured, are chiefly due to the successive curvatures which these descending root-fibres of the buds make in avoiding the previously developed twigs and branches, and to the included basements of those branches, which are thus gradually inclosed or surrounded by the fibres of the new wood, forming what are vulgarly called *knots*. Hence those trees called *dwarfs* or *pollards*, which develop the greatest number of small branches immediately from the trunk, though often less valuable as timber than those which have an erect

and well proportioned stem, are far more prized for cutting into veneers for ornamental works, on account that the more the bases of the branches are confounded, the more abundant will be the curvatures formed by the descending fibres of the buds, and consequently the more beautiful the wood. The celebrated oak of Fairlop, in Hainault forest, Essex, was a pollard of this description; and a very beautiful specimen of its wood may be seen in the reading-desk and pulpit of St. Pancras church in the New Road, north of London.

To protect the newly forming wood from injury, and prevent the premature contraction of the absorbent vessels of the growing buds (which are precisely analogous to the root-fibres of herbaceous plants,) during their progress downward, this process is carried on beneath the bark. In the spring, about the time when the buds of the trees begin to enlarge, the bark readily separates from the last year's wood; and a viscid secretion, called the *cambium*, which takes place between the two at that period, is probably the cause of this. It is conjectured that the descending fibres of the buds are nourished by this secretion; and we may even conceive that the ascent of the sap through the woody tubes—the first movement of it, at least, after the torpor of winter has subsided—is occasioned by the stimulus communicated to the vessels in the vicinity of the growing buds, to maintain the flow and supply the continued consumption of the cambium. The bark, which in speaking of the first year's shoot was regarded as a single integument, is in the trunk or older branches a compound of many, according to the age of the part it covers: a new layer is, indeed, formed annually, coëval with the formation of the new layer of wood; but the direction of its increase is the reverse of that of the wood, the new matter being internal or immediately surrounding the new layer of wood. The annual addition to the two, viz.: to the bark and wood—occasions the exterior layers of the former to separate on the trunks of old trees, and either peel off in strips, as in the common birch tree, whose stem looks at a distance as though striped with silver, in consequence of the newer bark appearing in the interstices left by the gradually deciduous old one; split into large brittle flakes, as in the plane, leaving the trunk curiously mottled with golden yellow: or, if it still remains attached, it assumes the cracked and ragged appearance characteristic of that of the elm. Each layer of the bark consists, like the first described as enveloping the newly developed shoot, of cellular tissue, the interior portion of which is intermingled with woody or tubular tissue; but as the bark increases in thickness, the outer coats gradually lose this regularly organized appearance, and become dead matter; hence the earlier botanists distinguished two separate barks, and considered that each of them was increased by a new annual layer. The outer, really disorganized portion, was denominated the *cortex*; the inner, more recently formed, was named the *liber*, the different coats or successive layers of which, being readily separable in some trees, formed among European nations one of the earliest materials used for writing upon, whence the indiscriminate use of the Latin word *liber* to express a book and the inner bark of a tree, the English words *bark* and *book* being likewise both derivable from the Saxon *boc*.

Experiment, which can scarcely be controverted, proves that the living portion of the trunk of an exogenous tree consists only of the outer layer of the wood and the inner one of the bark, or at least that the preservation of these only is sufficient to maintain the vegetation of the tree where they are of sufficient strength to stand alone: the bark, with the exception of the innermost layer, may be wholly removed without checking the vigor of its growth; the wood, as may be often seen, may be wholly decayed, with the exception of the outer coats, leaving the trunk a mere shell, which nevertheless puts forth fresh shoots every year, and covers itself with verdure. This is indeed the case, and has been perhaps for many centuries, with trees now standing, of enormous bulk, especially oaks, and among others that of Salcey in Northamptonshire, which some have computed to be more than 1500 years old. But if an incision be made, of sufficient width to prevent its healing rapidly, round the trunk of a growing tree, so as to penetrate both the bark and the outer circle of the wood, and remove a ring of the latter, its importance is readily demonstrated: if the experiment be made in the early part of the spring, previous to the flow of the sap, the death of the tree or branch inevitably follows. The operation is frequently performed in the back settlements of North America, preparatory to that of felling and removing the timber from the land, as the first step toward cultivation; it is there called *girdling*, and is done by cutting a complete circle with an ax round the trunk of the tree, so as to cut off all communication of the living wood with the root. Trees thus treated rarely survive beyond the season in which the operation is performed; but, it is said, there are exceptions, though these may probably be occasioned by unequal or imperfect removal of the woody circle in question. In experiments made in this country upon various trees, I have invariably met with the result above stated: the buds upon the isolated branch have been sometimes developed, or partially so; but, if the wound were sufficiently deep and uniform, so as to take away a portion all round of the last year's wood, no after-generation of buds took place, although all of the interior layers remain perfect—proving that the solid timber of a tree has nothing to do with the after-growth of it.

Taking into consideration the mode in which the diametrical increase of the trunks of exogenous trees take place, viz., the annual addition of a layer of wood and of bark between those previously formed, while the

older layers of the latter split or exfoliate when their tissue is no longer capable of distending, it would appear that there are no assignable limits to their growth; that there is no inherent cause, except the decay of vigor to which all organized bodies are subject after the lapse of a certain period, why their trunks, though originally a mile asunder, should not increase in bulk until they met, and thus, as a fanciful though ingenious philosopher once expressed his idea upon this subject, cover the whole earth with "ligneous mountains." However specious in theory, we have no facts in favor of the probability of such a result; and yet, to judge from their bulk, some trees still existing in a healthy state must have attained an enormous age; and, as when a tree is cut down the number of its years may be frequently ascertained with a tolerable degree of certainty, others have been actually examined, which had lived from 1,200 to 1,600 years. An attention to the age of trees, thus estimated, might occasionally assist an antiquarian in his researches, particularly, too, where the object of his curiosity had outlived the history of its date, or even passed the more extended notice of tradition; it has even been so employed. Of the above description of objects are those extensive embankments in the neighborhood of the Great Lakes of North America, supposed to be the ruins of ancient fortifications; they are evidently the work of a race different from that of the present Indian tribes of those parts, who possess no tradition of their origin, and seem to entertain no opinion at all respecting their use; they are regularly formed, and generally built where a ravine or natural high bank strengthens the one side; the walls are of earth, and at present about five or six feet in hight; at some past period they may have been considerably higher, as when first discovered trees of very large size were growing upon the mounds, indicating the lapse of a considerable space of time since their erection. A continued barrier of these works is said to extend from the northern side of Lake Ontario toward the river district, and thence across to the vast plains that reach the Mississippi. Now fortifications, however rude, upon the extensive scale on which these are described by travelers, must be connected with some very important feature in the history of the country they traverse, and have given rise to various speculations concerning their origin; however, by counting the number of woody circles in some of the trees just mentioned, it has been ascertained that upward of 450 years must have elapsed since the works were abandoned, or rather since Nature began to reässert her dominion over the usurping power of Man, at which period it is but reasonable to suppose the trees in question first rose from seed upon the spot where they had so long flourished. This calculation brings the possible date of their origin nigh to an epoch which renders it far from improbable that they were the work of the ancient Mexicans, previous to the migration of that people southward, of which circumstance, it is well known, their tradition at the time of the Spanish Conquest had preserved the memory.

The age of a growing tree cannot be estimated by any known characters; and on this account, and perhaps in some measure owing to mankind being naturally fond of the marvelous, some remarkable trees still standing have had a most extraordinary age assigned to them. It is true that various rules for ascertaining it, founded upon careful observation, have been laid down by certain naturalists; but they are too arbitrary to satisfy a rigid inquirer. Bosc and others have allowed a foot in diameter for the growth of a hundred years in the oak. Now there are oaks growing in this country at the present day, which, according to their calculation, must be from 1,000 to 1,500 years old, their trunks being from 10 to 15 feet in diameter at the surface of the ground. It is not intended to deny the possibility of a tree attaining this or even a much greater age, but merely to show the fallacy of the grounds upon which calculations are made. So long as a tree continues to live, there must be an annual development of buds, and, however thin it may sometimes be, an annual formation of wood. So long, therefore, as a tree exists, a diametrical increase of the trunk must take place in one direction or another, if not generally; and that increase will be proportionate to the number of buds unfolded—in other words, to the quantity of foliage, to the luxuriance of the tree; consequently, when a tree has been flourishing in a perfect state for some centuries, its diameter will be proportionally greater than that of another, which has had its branches broken by storms or scathed by lightning, and its number of buds thus diminished. I will adduce one example of the fallacy of calculations made upon the diametrical increase of the trunk of a tree indicating its age. The Golenos oak, a very remarkable one of its kind, which grew about four miles from Newport in Monmouthshire, was felled for the use of the Navy in the year 1810; the diameter of the trunk of this tree, which was perfectly sound in every part, and at the time of its being felled was in full luxuriance of growth, was nine feet and a half. Now, according to the above mode of calculation, (a foot in a century,) this tree would have been estimated, while standing, to be 950 years old. I am not acquainted with the precise number of its woody layers, but they were considerably under 450—to the best of my recollection, 436 or 437. Here, then, had been a diametrical increase of more than double the standard allowed by Bosc, which sufficiently shows the little dependence that ought to be placed upon computations of the kind. Speaking of this particular tree, we ought not to omit remarking upon a curious, though not a sin-

gular circumstance that was brought to light during the process of converting, that is, of reducing it to the form required for the purpose to which it was destined to be applied. When the main trunk was sawn through, a stone of six inches in diameter was found inclosed in its substance, three feet deep in the body of the tree, and about six feet from the ground when it was standing. Such or similar phenomena are not of unfrequent occurrence: we have often heard, not only of stones and other inorganic bodies, but of toads and serpents thus enveloped in logs or masses of wood; and although the alleged vitality of the latter on exposure to the light and air may be reasonably questioned, their lodgment is far from being miraculous. There are perhaps few growing trees that have not suffered dismemberment of a branch, or by some other accident had a temporary hollow or wound inflicted on their trunk, in which a stone might be lodged by some dexterous youth, or a reptile might hide itself to doze out the approaching winter. The growth of the wood of a luxuriant tree in the spring is much more rapid than might generally be imagined—indeed, I may state from my own observation, in some species almost astonishing; and the wound would be more quickly healed or closed in when thus partially filled by an extraneous body, and the stone imbedded, or the waking reptile prevented from escaping by the contraction of the aperture, and, after a lapse of many years, be found occupying a place in the solid timber of the tree, without any visible trace of the passage by which it had entered or been introduced, because the succeeding layers of wood, meeting with no interruption in their descent, would be entire.

There is another circumstance here worthy of notice respecting the production of the wood; it is the difference observable in the thickness of the layers proportionally with each other, and likewise of the same layer in different parts of its circumference; the former difference depends upon the nature of the season in which each individual layer is formed, the latter upon the situation of the tree. You can scarcely examine a horizontal or cross section of the trunk of a tree, in which there is not a very manifest inequality in the diameter of the different annual deposits of its wood. Now, as I have shown you that the wood is formed by the descending fibres or roots of the buds, the quantity produced during each season of growth must depend upon the number of buds developed, and the vigor with which they are extended into branches; each leaf contributing, as it unfolds, its quota of woody substance to the general mass. Both of these will vary from a variety of circumstances, more especially from the temperature and vicissitudes of the season that brings them forth. When the spring is cold, and sharper winds prevail than ordinary; when severe frosty nights or mornings succeed hot days; or when a few weeks of sultry weather are succeeded by a dull, ungenial atmosphere and chilling rains, many of the buds, wakened into action by the warmth of the sun, are cut off by the frost and other changes of the weather, and, of necessity, a less luxuriant vegetation is the consequence; the layer of wood formed during that summer will be thinner than that produced under circumstances more congenial. In an oak-tree that Linnæus examined in the island of Eland, in the Baltic Sea, he discovered, and has recorded a very remarkable proof of this fact, in the comparative thinness of the woody layers, which from their situation, counting inward or from the circumference to the center, he ascertained to have been produced during the years 1709, 1687 and 1578, these three years being memorable in the North of Europe for the shortness and low temperature of their summers and the severity of their winters.

In regard to the difference resulting occasionally between opposite parts of the same layer, it arises from similar ultimate causes; but these depend upon the situation of the tree. You will perhaps rarely meet with a section of a trunk in which the pith, or rather the place it originally occupied, which is the center around which the various layers are deposited, is in the exact center of the mass, and frequently it is widely apart from that point. When a tree grows in the heart of a forest, or of a plantation, or in any equally sheltered spot, the disposition of the layers will be most regular; but when it stands in an open situation, the layers of wood are uniformly found to be thicker upon the south than on the north side of the trunk; a difference probably occasioned by the sap flowing with greater celerity, and the secretions being more abundant, on the side most exposed to the influence of the sun's rays, that, while they contribute to the relaxation of the vessels, and render by their warmth the sap more fluid, probably favor a more copious precipitation of the carbon and other principles that enter into the formation of the woody fibre. Added to this, there is generally a more exuberant growth, or rather development of buds upon the south side of a tree that grows equally exposed; and though their fibres may not always descend perpendicularly, it may readily be conceived that they would tend toward that side of the trunk where the tissue was the most yielding and the secretion of the cambium most abundant.

The mode of growth we have here detailed as that characterizing an exogenous or outward growing plant can only be understood by constant reference to the compound nature of those bodies which in common estimation we regard as possessing an individual existence. Every plant, after its first development from seed, becomes really an increasing combination of many; every leaf is an individual, every bud multiplies and becomes a family; and these families are successively

produced in the exogen upon the dying bodies of their predecessors, sending down from year to year their roots over their roots, and thus producing an accumulation of woody matter, in as it were a succession of hollow cones, cone over cone. This conical form of the trunk, as it is called, is a constant character of all the trees of this vast class of vegetation; the base of it is always larger than the parts above, and they taper to their extremities, as is seen in the trunks and branches of all our English trees and shrubs. The tendency to this form is shown even in the annual stems of herbaceous plants, the base of which is larger than the upper end in consequence of its containing the woody tubes descending from a greater number of leaves and developing buds. The characters resulting from exogenous increase can scarcely be traced in a perennial herb, and in those of annual duration are altogether wanting; but the stratification of the tissue is the same as in the young shoot or incipient branch of a tree: the external bark, the woody sheath, the central column of pith, even the medullary rays, the connecting medium between the pith and the bark, are present. The production of these latter and other circumstances connected with the differential characters of exogens and endogens, in their earlier stages of growth, will be illustrated when we come to discuss the phenomena of the germination of the seed; at present we will content ourselves with a comparatively superficial glance at the several structures, leaving their ultimate origin for after consideration, when we have become a little more familiar with the more obvious facts and the general opinions deducible from them.

TABLE,

Showing the Value of Foreign Coins, Weights and Measures.

RATES AT WHICH FOREIGN MONEY OR CURRENCY ARE FIXED BY LAW.

Franc, of France or Belgium	$0	18	6-10
Florin, of Netherlands		40	
Florin, of Southern States of Germany		40	
Guilder, of Netherlands		40	
Livre, (Tournois) of France		18	1-2
Lira, of the Lombardo-Venitian Kingdom		16	
Lira, of Tuscany		16	
Lira, of Sardinia		18	6-10
Milrea, of Portugal	1	12	
Milrea, of Azores		83	1-8
Marc Banco, of Hamburg		35	
Pound Sterling, of Great Britain	4	84	
Pound, of British Provinces of Nova Scotia, New-Brunswick, Newfoundland and Canada	4	00	
Pagoda of India	1	84	
Real Vellon, of Spain		05	
Real Plate, of Spain		10	
Rupee Company		44	1-2
Rupee, of British India		44	1-2
Specie Dollar, of Denmark	1	05	
Rix Dollar, or Thaler, of Prussia and the Northern States of Germany		69	
Rix Dollar, of Bremen		78	3-4
Ruble, Silver, of Russia		75	
Specie Dollar, of Sweden and Norway	1	06	
Florin, of Austria		48	1-2
Ducat, of Naples		80	
Ounce, of Sicily	2	40	
Tale of China	1	48	
Leghorn Livre		16	

TABLE OF FOREIGN WEIGHTS AND MEASURES, REDUCED TO THE STANDARD OF THE U. STATES:

Amsterdam.

100 lbs., 1 centner	pounds	108·93
Last of grain	bushels	85·25
Ahm of wine	gallons	41·00
Amsterdam foot	foot	0·93
Antwerp foot	foot	0·94
Rhineland foot	feet	1·03
Amsterdam ell	feet	2·26
Ell of the Hague	feet	2·28
Ell of the Brabant	feet	2·30

China.

Tael	ounce	1 1-2
16 taels 1 catty	pounds	1 1-2
100 catties 1 picul	pounds	133 1-4

England.

Old ale gallon	gallon	1·22
Imperial gallon	gallon	1·20
Old wine gallon	gallon	1·00
Quarter of grain, or 8 imperial bush.	bush.	8·25
Imperial corn bushel, or 8 imp'l gall.	bush.	1·03
Old Winchester bushel	bush.	1·00
Imperial yard	inches	36·00
Troy pound	pounds avoirdupois	144·175

France.

Metre	feet	3·28
Decimetre (1-10th metre)	inches	3·94
Velt	gallons	2·00
Hectolitre	gallons	26·42
Decalitre	gallons	2·64
Litre	pints	2·11
Kilolitre	feet	35·32
Hectolitre	bushels	2·84
Decalitre	quarts	9·08
Millier	pounds	22·05
Quintal	pounds	220·54
Kilogramme	pounds	2·24

Portugal.

100 pounds	pounds	101·19
32 pounds (1 arrobe)	pounds	32·26
4 arrobes, of 32 pounds, (1 quintal)	pounds	89·05
Alquiere	bushels	4·75
Majo, of grain	bushels	23·03
Last, of salt	bushels	70·00
Almude, of wine	gallons	4·37

Russia.

100 pounds, of 32 laths each	pounds	90·26
Chertwert, of grain	bushels	5·95
Vedro, of wine	gallons	3·25
Petersburg foot	gallons	1·18
Moscow foot	gallons	1·10
Food	pounds	1.36

Sweden.

100 pounds, or 5 lispunds	pounds	73·76
Can, of can	bushels	7·42
Last	bushels	75·00
Cann, of wine	gallons	69·09
Ell, of cloth	feet	1·95

Smyrna.

100 pounds, (1 quintal)	pounds	129·48
Oke	pounds	2·83
Quiltal, of grain	bushels	1·46
Quiltal, of wine	gallons	13·50

AGRICULTURE OF MECKLENBURG COUNTY, VA.

THE SOIL, PRODUCTS AND RESOURCES OF MECKLENBURG COUNTY, VIRGINIA;

BY PROFESSOR J. W. HARDY, PRESIDENT OF RANDOLPH MACON COLLEGE.

To the Editor of The Farmers' Library. MECKLENBURG, 1847.

Dear Sir: At a meeting of the "HOLE AND CORNER FARMERS' CLUB" No. 1, Mecklenburg County, Va., I submitted the Essay of Professor HARDY, and it was unanimously resolved to recommend its publication to you. The Club furthermore desired to express its thanks to Prof. HARDY for the analyses of their soils, which cost him no little trouble. We hope, however, he may be in some measure remunerated by the reflection that we shall therefrom reap the profits.

Yours, truly, W. H. JONES.

[The Club may better estimate the value of Professor HARDY's labors, when they are informed that an eminent Professor lately answered to an inquiry that he did not think Indian corn, *in all its parts* separately, and in all the stages of its growth, could be analyzed for less than $500—supposing the labor and time it would require to be properly and fairly estimated, and paid for as it should be. In these cases, we are not to value the labor and the fruits of a mind highly and laboriously cultivated, as we would days' work at ditching or breaking stone for a turnpike; you would not expect to pay Doctor Buckler or Stuart, of Baltimore, or the Beckwiths, of Petersburg, or Hall, or Jones, of Washington, for a professional opinion, what you would give to a horse-doctor. When knowledge is rare, of a high order of science, and attained only by intense application and heartfelt anxiety, for its own sake, and for the honor it should always lead to, it should be remunerated accordingly: and these demands upon men of rare acquirements should be made, and well compensated, by the General Government and State Societies and Institutes that have money at command. Literary and scientific institutions have, properly, no concern with bank stocks and public funds and schemes of accumulation which, when realized, too often lead to sordid and sinister or wild and visionary speculations. They should keep their funds in activity as fast as received, for the reward and diffusion of knowledge. These funds belong to the public and are placed in their hands as trustees, to be used—not hoarded—and every man in society—at least every one who makes the least contribution, has a right at all times to a knowledge of whatever is received by public institutions, under acts of incorporation or authority of law, and to advise as to its administration and use. There will always be people on the watch to come in for a share of the surplus of funds, as surely as honey will attract flies.

We feel indebted to the Club of Mecklenburg for the favor of sending this communication to be preserved in The Farmers' Library. The extra copies offered to be paid for, the Publishers have directed to be sent gratuitously and with pleasure. If some delay has occurred in the publication, it has arisen from a press of matter and from the knowledge that the facts communicated have relation to principles rather than to any particular time or season, and would bear to be kept, yet not to be lost. *Ed. Farm. Lib.*]

Gentlemen: During the two or three past years I have given as much attention to the Agricultural Chemistry of your County as my time and circumstances permitted. At your request, and in compliance with my own wishes, I undertook, during the past winter, a more particular examination of the soil, manures and other agricultural resources of the County. I shall now place before you a portion of the results which I have obtained.

The County of Mecklenburg lies mainly between 36° 31½′ and 36° 50′ north latitude, and 1° 2′ and 1° 40′ west longitude from the City of Washington. Its climate is comparatively mild and salubrious; its surface is diversified with the various productions of the temperate zone, and its soil is characterized by abrupt changes and extensive variety.

Its population in 1840 amounted to 20,724, consisting of 7,756 whites and 12,968 blacks. This population subsists on the products of the soil, 6,572 of its inhabitants being employed in Agriculture, while only 789 are engaged in all other pursuits.

The staple products of its soil were, according to the Reports of the last Census, as follows:

TABLE No. 1.

Wheat	77,444 bushels	Potatoes	25,107 bushels
Oats	224,107 ..	Tobacco	4,124,134 pounds
Indian Corn	472,345 ..	Cotton	153,640 ..

Territory of considerable extent is before us, occupied by an agricultural population, and supplying a considerable share of agricultural products. I propose to consider the Agriculture of this County in its relations to Chemical Science; and in so doing I shall simply present a statement of facts ascertained by myself and others, and make such deductions and suggestions as seem to be appropriate, and as time would allow.

The first inquiry I shall make is this: "What is the chemical composition of the several staple products of this County in their mature state?" In the answer I shall give to this important inquiry, I shall consider the products in the order in which they are arranged in Table 1.

Plants are composed of two kinds of chemical substances, organic and inorganic; and this distinction will be observed in what follows. For nearly all the results in organic analysis I am indebted to the labors of others; and on this account they are, perhaps, deserving the greater confidence.

Wheat (*Triticum hybernum*).—Ultimate analysis gave Boussingault for the organic elements of the grain and the straw the following results:

TABLE No. 2.

	Grain.	Straw No. 1.	Straw No. 2.
Carbon	46·6	52·06	52·06
Oxygen	44·15	41·73	42·00
Hydrogen	5·8	5·84	5·57
Nitrogen	3·45	0·37	0·37
Total	100·00	100·00	100·00

Vauquelin ascertained by proximate analysis that the composition of *flour* is as follows:

Gluten 10·2; Starch 72·8; Sugar 4·2; Gum 2·8; Water 10·0=100·0

Boussingault analyzed 24 specimens of the different varieties of wheat in reference particularly to the relative proportions of bran and flour in the grain. He ascertained that the bran varied from 13·2 to 38·5 per cent. and the flour from 86·8 to 61·5 per cent. The composition of the flour in the 24 specimens was found to be as follows:

Gluten and albumen varied from	18·2 to	25·5
Starch, sugar, gum and water	81·8 to	74·5
Total	100·0	100·0

The following analyses of flour are from portions obtained from Col. Wm. Townes and John Jones, Esq.

TABLE No. 3.

	Townes.	Jones.		Townes.	Jones.
Starch	56·5	55·8	Oil	0·8	1·0
Albumen	0·9	1·0	Water	5·0	4·6
Sugar	1·2	1·4	Soluble salts (P)	0·5	0·8
Gluten	17·0	18·5	Husk and bran	16·5	15·3
Gum	1·3	1·5	Total	99·7	99·9

Having given these results of organic analysis, I will add, for reference, the ultimate analysis of the more important compounds contained in the last Table:

TABLE No. 4.

	Carbon.	Oxygen.	Hydrogen.	Azote.
Starch	*44·9	48·8	6·3	0·0
Gum	†42·3	50·8	6·9	0·0
Sugar	‡47·1	47·0	5·9	0·0
Gluten	‖54·76	20·06	7·06	18·12
Albumen	‖54·76	20·06	7·06	18·12

From the preceding statement of facts it is inferred that the organic elements of wheat, including the straw and the grain, are carbon, oxygen, hydrogen, and azote, in the various proportions just given, and forming the proximate elements above described.

The inorganic elements are discovered by burning the plant and analyzing the ashes.

Three specimens of wheat, including the *entire* stalk, grain and all, selected by myself just before harvest, from the fields of Rev. H. G. Leigh, Mark Alexander and A. J. Jones, Esqs., during the years 1845 and 1846, gave the following results:

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* By Jacquelaine. † By Gay-Lussac and Therard. ‡ By Peligot. ‖ Scheerer.

TABLE No. 5.

	Specimen 1st. Leigh's.	2d. Alexander's.	3d. Jones's.
Silica	81·0	81·5	79·0
Alumina	1·8	0·9	1·6
Potash	0·9	0·5	1·0
Soda	1·0	0·5	1·0
Ox. iron & manganese	1·0	0·5	1·4
Phosphoric and sulphuric acids	5·8	6·5	7·0
Lime	8·0	9·2	9·0
Carbonic acid	0·5	0·4	0·0
Total	100·0	100·0	100·0

Specimen 1st gave 6·9 per cent. of ash; specimen 2d gave 7·3 per cent.; specimen 3d gave 7·8 per cent.

The following is given by Sprengel as the composition of the *straw ash* of wheat:

Potash	0·6	Silica	81·6	Sulphuric acid	1·0
Soda	0·8	Alumina and the oxides of iron and manganese	2·6	Chlorine	0·9
Lime	6·8	Phosphoric acid	4·8	Total	100·0
Magnesia	0·9				

The facts stated in Table 5 show that while the ashes of wheat are composed of nearly the same ingredients in all cases, the proportions of the ingredients vary with the nature of the soil, or some other condition of the plant's growth. Thus the lime varies from 8 to 9·2 per cent.; the silica from 79 to 81·5 per cent. The *first* specimen is from a light sandy soil, the *second* from a clay soil highly manured, and the *third* from the second low ground of Butcher's Creek, a deep clay loam with iron.

Oats.—By organic analysis the following results have been obtained:*

TABLE No. 1—Mean of three samples of the *whole* plant.

Carbon 48·0; Hydrogen 6·3; Oxygen 44·0; Nitrogen 1·5; Loss 0·2=100·0

In the specimens of the grain from Prof. Doggett, Mr. J. J. Atkins and Col. F. W. Boyd, the following proportions were given:

TABLE No. 2.

	Doggett.	Atkins.	Boyd.		Doggett.	Atkins.	Boyd.
Carbon	51·5	52·3	50·5	Azote	2·2	2·0	2·0
Oxygen	58·5	37·6	39·0	Loss	0·3	0·1	0·0
Hydrogen	7·5	8·0	8·5	Total	100·0	100·0	100·0

Analysis was also made of the straw from which the grain of the preceding Table was taken:

TABLE No. 3—*Straw*. Mean of three analyses.

Carbon 51·0; Oxygen 41·5; Hydrogen 6·0; Azote 0·7; Loss 0·8=100·0

The oat *grain* gave of ashes 3·5 per cent.; the straw 6 per cent.; their composition, as given by three analyses, being as follows:

TABLE No. 4.—Ashes of Oats and Straw.

	Grain.	Straw.		Grain.	Straw.		Grain.	Straw.
Silica	54·8	81·0	Oxides of iron and alumina	2·0	0·4	Carbonic acid	2·0	0·2
Potash	13·5	14·0	Sulphuric acid	1·5	0·8	Water and loss	0·7	0·0
Magnesia	6·5	0·5	Phosphoric acid	15·0	0·1	Total	100·0	100·0
Lime	4·0	3·0						

Indian Corn, or Maize.—This invaluable crop has received heretofore comparatively little attention from chemists, and I have, therefore, thought it desirable to examine, during the last two years, various specimens. This has been done with as much care as my time and means would allow, and though I give the results of my own labors, I do so with some distrust, especially in organic analyses. Table No. 1 gives the mean of five analyses of the grain obtained from Messrs. G. Jones, J. Mason and P. Burnet.

TABLE No. 1.—Grain.

Carbon 48·00; Oxygen 44·00; Hydrogen 6·00; Azote 2·00=100·00

The proximate elements are as follows:

TABLE No. 2.

Starch 72·00; Gluten, albumen, &c. 12·50; Fat or oil 9·20; Woody tissue 6·30=100·00

The entire straw or stalk of the Indian corn contains the following elements:

TABLE No. 3.—Stalk.

Carbon 50·5; Oxygen 43·0; Hydrogen 6·0; Azote 0·5=100·00

The grain contains 1·6 per cent. of ash, which is composed as follows:

TABLE No. 4.—Ash of Grain.

Lime 1·5; Magnesia 17·6; Alkalies 23·3; Silica 2·4; Phosphoric acid 51·0; Sulphuric acid 1·3; Oxides of iron, alumina, &c. 1·8; Carbonic acid 0·9; Loss 0·2=100·0

* I think it proper to state that I do not rely with entire confidence in the results of *organic* analysis, as stated in this Essay. I consider them approximations.

The entire stalk, the grain only excepted, gives 5·2 per cent. of ash, composed as follows:

TABLE No. 5.—Ash of the Stalk.*

Lime 5·6; Magnesia 6·0; Alkalies 3·0; Silica 78·5; Oxides of iron, alumina, &c. 1·8; Phosphoric acid 3·6; Sulphuric acid 1·5=100·0

It will be observed here as somewhat remarkable that the amount of magnesia is greater than that of lime in the ashes of Indian corn. In truth, the relative amount of the former is quite unexpected and important. If so large an amount be usual, it may be connected with essential principles in the growth and economy of the plant.

Irish Potato (*Solanum tuberosum*)—*Of the Root and Tops.*—Boussingault gives the ultimate constituents as follows:

TABLE No. 1.—Root and Tops.

	Root.	Tops.		Root.	Tops.
Carbon	45·33	54·47	Azote	1·56	2·78
Oxygen	47·07	36·38	Total	100·00	100·00
Hydrogen	6·04	6·37			

The following Table gives the mean of five analyses of the ashes from potatoes grown in the country:

TABLE No. 2.—Ashes of Root and Tops.

	Root.	Tops.		Root.	Tops.		Root.	Tops.
Silica	6·8	12·5	Magnesia	4·5	2·0	Phosphoric acid	12·5	9·6
Potassa	52·5	45·3	Oxide of iron and			Sulphuric acid	7·0	9·0
Soda	0·5	0·7	alumina	1·0	6·0	Loss, &c.	0·7	0·4
Lime	2·0	2·5	Carbonic acid	12·5	12·0	Total	100 0	100·0

I have also obtained by proximate analysis the following results as the mean of three analyses of the Potato. The specimens used were grown in the vicinity of the College, in clay soils, artificially manured. I also add a proximate analysis from Liebig by Henry:

TABLE No. 3.—Proximate Elements of the Potato.

		Henry.			Henry.
Water	74·00	73·12	Fatty matter	0·60	1·12
Starch	12·50	13·30	Salts	2·00	1·40
Woody fibre	7·50	6·79		100·00	99·95
Gluten, albumen	1·00	(Albumen) 0·92	Volatile poisonous matter		0·05
Sugar	2·40	3·30			100·00

Sweet Potato (*Convolvulus batatas*).—Of this valuable root I have been able to prepare no analysis except of the ashes. The succeeding Table contains the results:

TABLE No. 1.—Root and Tops.

	Root.	Tops.		Root.	Tops.		Root.	Tops.
Potassa	54·6	46·8	Magnesia	4·3	3·4	Sulphuric acid	8·4	8·7
Soda	0·8	0·6	Oxides of iron,			Carbonic acid	6·0	8·0
Silica	5·4	10·5	alumina, &c.	1·5	7·0	Total	100·0	100·0
Lime	3·5	4·0	Phosphoric acid	15·5	11·0			

This is the composition of a variety commonly called the *yam*, grown in the garden of Mr. George Jones. Other varieties have not been particularly examined.

Tobacco (*Nicotiana tabacum*).—MM. Posselt and Reimann, two German chemists, give the following as the results of proximate analysis. The terms employed may be understood by reference to any elementary work on Chemistry:

TABLE No. 1.—Proximate Analysis of Tobacco Leaves.

Nicotina	0·060	Malic acid	0·540	Silica	0·088
Nicotine	0·010	Malate of ammonia	0·120	Lignis	4·969
Bitter extractive	2·870	Sulphate of potash	0·048	Water	87·280
Gum and a little malate of lime	1·740	Chloride of potassium	0·063	Starch	a trace
		Malate and nitrate of potash	0·095		99·876
Green resin	0·267	Phosphate of lime	0·166	Loss	0·124
Albumen	0·260	Malate of lime	0·242	Total	100·00
Gluten	1·048				

All of the bodies here mentioned besides the mineral constituents, are composed essentially of carbon, hydrogen and oxygen, with a small portion of nitrogen in a few instances.

The ashes of this plant I have examined in various ways, and will give the results of two attempts in the succeeding Table:

TABLE No. 2.—Ashes of Tobacco.

	Specimen No. 1. J.W.Jones.	*No.* 2. A.S.Jones.		*Specimen No.* 1. J.W.Jones.	*No.* 2. A.S.Jones.		*Specimen No.* 1. J.W.Jones.	*No.* 2. A.S.Jones.
Silica	15·59	14·50	Chlo. potassium	1·75	1·80	Phosphoric acid	14·80	15·00
Lime	11·60	14·25	Alumina and ox.			Ammonia	2·00	1·50
Magnesia	7·75	6·50	manganese	4·50	3·20		99·84	99·80
Potassa	7 30	8·40	Carbonic acid	19·75	18·00	Loss	0·16	0·20
Soda	2·50	2·75	Sulphuric acid	12·30	13·90	Total	100·00	100·00

* This stalk was a very sorry specimen from the sand-bank on Mr. Baptiste's low ground. I examined it on account of its defects mainly. Deficient in the alkalies.

No. 1 was a light tobacco, used for smoking. No. 2 was grown on land that had been limed, and was considered a fair sample of marketable tobacco.

Cotton (*Gossypium herbaceum*).—I have made no attempt to analyze the stalk of this plant, nor of the seed. The ashes of the stalk as grown on the small farm of Mr. Geo. Jones are composed as follows:

TABLE No. 1.—Ashes of the Stalk.

Silica	15·5	Lime	8·2	Chlorine	0·5
Alumina	2·7	Magnesia	5·5		99·8
Peroxide of iron	3·4	Carbonic acid	16·5	Loss	0·2
Potassa	20·5	Phosphoric acid	9·0	Total	100·00
Soda	10·5	Sulphuric acid	7·5		

I have attempted the organic analysis of the cotton yarn. Table No. 2 gives the result:

TABLE No. 2.—Cotton Yarn.

Carbon 65·15; Hydrogen 4·50; Oxygen 30·35=100·00

Dr. Ure has given the following as the composition of the ashes of the Sea Island Cotton fibre:

TABLE No. 3.—Ash of Sea Island Cotton.

Phosphate of lime	9·0	Peroxide of iron	3·0	Sulphate of potash	9·3
Carbonate of lime	10·6	Carbonate of potash	44·8	Alumina a trace, and loss.	5·0
Phosphate of magnesia	8·4	Chloride of potassium	9·9	Total	100·0

The soil of this County I have examined with some care, though not as extensively as I desired and intended. I anticipated much pleasure and profit in analyzing the various soils of the County and in forming an agricultural map; but the unusual pressure of College duties and other circumstances, have thus far forbidden. The following Table contains such analyses of the soil as I have made:

TABLE No. 1—Containing the Composition of various Specimens of Soil and Subsoil of Mecklenburg County, Virginia.

COMPOSITION	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13
Wat. of absor.	6·50	8·00	8·00	5·00	9·5	8·50	6·50	8·50	8·50	8·00	7·55	9·00	6·50
Veget. fibres	3·00		1·00	7·00		1·50	3·00			5·50	5·00	2·00	1·75
Soluble gum	3·50	0·50	2·00		1.5	3·00	2·50		1·00	4·00	4·40	3·50	2·50
Insolu. gum.	5·50	1·00	3·00		2·0	5·00	3·00		2·00	5·30	4·00	4·00	3·75
Sand	49·50	30·00	31·00	61·00	14·0	26·00	62·00	42·00	53·00	30·00	35·00	50·50	37·00
Silica	13·75	31·50	29·50	15·00	46·0	29·00	12·50	27·00	20·55	25·00	27·00	16·00	26·50
Alumina	9·25	19·45	18·50	10·25	21·0	18·00	8·00	16·50	11·00	16·00	12·00	10·55	16·75
Perox. iron	2·00	2·55	1·50	1·75	2·0	2·50	0·50	1·00	0·50	0·25	a trace	0·25	1·00
Ox. mangan.	0·80	0·40			0·10	0·75		0·30					a trace
Potassa, soda	0·50	0·55	0·60		0·75	0·65	a trace	a trace	0·20	0·75	0·60	0·50	0·40
Lime	1·40	2·00	1·50		0 50	0·75	0·25	0·10	1·30	2·50	2·40	1·50	0·75
Magnesia	0·60	0·65	0·40		0·20	0·50	0·20	0·20	0·45	0·50	0.45	0·30	0·50
Carb. acid	0·65	0·70	0·20		0·45	1·00	0·25			0·40	a trace	0·40	0·30
Sulphu. acid	0·60	1·80	1·15		0·40	0·90	0·50	1·00	0·62	0·50	0·40	0·50	0·50
Phosph. acid	1·40	0·40	1·33		0·60	1·20	0·25	0·50	0·75	1·00	1·20	0·75	0·75
Chlorine	0·40				0·35					0·10	a trace		
Ammonia	0·35				0·30	0·50				0·20	a trace		0·20
Protox. iron.				1·60			0·25	2·50					
	99·70	99·50	99·70	100·00	99·65	99·75	99·70	99·60	99·87	100·00	100·00	99·75	99·15
Loss	0·30	0·50	0·30		0·35	0·25	0·30	0·40	0·13			0·25	0·85
Total	100·00	100·00	100·00	100 00	100·00	100·00	100·00	100·00	100·00	100·00	100 00	100·00	100·00

COMPOSITION	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26
Wat. of absor.	7·00	7·50	6·00	7·00	6·5	5·00	7·00	8 00	8·20	7·50	6·00	6·50	7·00
Vegeta. fibres		1.50	1·75	2·50	2·25		2·00	4·00	5·00	2·20	3·50	0·10	
Soluble gum		2 00	1·50	1·75	2·75		2·50	4·30	4·50	2·00	3·00	0·50	
Insolu. gum.		2·75	2·75	3·00	2·00		2·30	5·50	5·40	2·50	3·20	0·25	
Sand	18·00	38·00	36·00	51·00	51·00	56·00	50·10	53·4	46·00	62·50	62·00	56·00	42·00
Silica	45·35	26·00	28·00	16·00	18·00	21·00	20·40	11·00	15·20	11·00	10·50	17·50	29·5
Alumina	24·50	17·00	19·00	10·50	12·00	12·00	11·00	6·40	8·80	7·00	7·00	12·75	19·00
Perox. of iron	3·00	2·00	0·50	1·00	1·00	2·00	0·40	0·85	0·40	1·20	0·60	1·50	1·7
Ox. mangan.	a trace	a trace					0·30	0·30	0·20		a trace	0·10	
Potassa, soda	0·10	0·50	0·50	0·60	0·60		0·55	0·50	1·00	0·70	0·8	0·50	
Lime	0·50	1·00	0·75	0·50	1·00	0·75	1·20	1·70	1·80	1·50	1·75	1·60	0·10
Magnesia	0·20	0·50	0·30	0·25	0·30	0·40	0·50	0·80	0·60	0·30	0·25	0·30	0·10
Carb. acid		0·10	0·40	1·00	0·25		0·20	0·50	0·75		0·20		
Sulphu. acid	0·40	0·27	0·60	0·75	0·50	0·80	0·55	0·70	0·60	0·60	0·55	0·75	
Phosph. acid	0·50	0·40	0·70	0·70	0·60	1·00	0 60	0·75	0·55	0·50	0·50	0·80	0·20
Chlorine					0·25		0·30					0·20	
Ammonia					a trace			0·25	0·30		a trace		
Protox. iron.			0·25		0·25	0·50	0·10	0·35	0·20	0·50	0 10	0·20	
Chlo. sodium			0·25					0·40	0·25				
	99·55	99.59	99·25	99·55	99·25	99·45	100·00	100·00	99·75	100·00	99·95	99·55	99·6
Loss	0·45	0·48	0·75	0·45	0·75	0·55			0·25		0·05	0·45	0·4
Total	100·00	100·00	100·00	100 00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

No. 1 is a loamy soil of specific gravity 2·353, from the hill-side rising from the Roanoke low ground. The land belongs to Richard B. Baptiste, Esq., and this is true of the first six specimens. No. 2 is from the bottom of a ditch 3 feet deep in the Roanoke low ground; clay loam of specific gravity 2·272. No. 3 is from the Roanoke low ground, below the house; loamy soil of specific grav. 2·222. No. 4 is from a sand-bank near the river, of sp. grav. 2·567. No. 5 is from an old pond, 2 yards from the ditch on the side toward the river; subsoil clay, of sp. gravity 2·778. No. 6 is the soil from the same place; clay loam of sp. grav. 2·200. No. 7 to No. 15 inclusive are from the lands of Alexander Jones, Esq. No. 7 is from a field east of the house; soil loamy iron of sp. grav. 2·380. No. 8 is the subsoil of No. 7; sp. grav. 2·272. No. 9 is limed subsoil, second low ground Butcher's Creek, loamy, sp. grav. 2·173. No. 10 is the soil of No. 9, clay loam, spec. gravity 2·130. No. 11 was supposed to be unlimed, from the same place as the preceding; soil loamy; sp. grav. 2·222. No. 12 is from the low ground of Butcher's Creek, opposite the old house on Mr. S. Lockett's land; loamy soil of sp. grav. 2·222. No. 13 is from a field in cultivation 80 years; soil south of the walnut tree; loamy; sp. grav. 2·173. No. 14 is subsoil of the preceding, clay, of sp. grav. 2·170. No. 15 is from the field that had been subsoiled; loamy; sp. grav. 2·130. No. 16 is from the land of Mr. Geo. Jones, lot west of the house; loamy clay soil; sp. grav. 2·326. No. 17 is from the land of Col. F. W. Boyd, from the newly cleared field on the road to Lombardy Grove; loamy soil; sp. grav. 2·345. The next three specimens are from the land of Dr. Wm. Jones. No. 18 is from the field on the same side with the house near the lane and opposite the barn south of the house; loamy; sp. gravity 2.440. No. 19 is the subsoil of No. 18; red clay; sp. gravity 2·200 (a remarkable result compared with the preceding). No. 20 is from the same field, 100 yards from the lane in the bottom; loamy soil; sp. grav. 2·400. Nos. 21 to 26 inclusive are from Col. Lockett's farm, Richland. No. 21 is from the lot toward the river, at the old house; loamy soil; sp. grav. 2·400. No. 22 is from the tobacco lot, old garden near the old house; loamy soil; sp. grav. 2·398; No. 23 is from the same spot as No. 21, but 18 inches deeper; sandy loam; sp. grav. 2·222. No. 24 is from the same spot as No. 22, but 1 foot deeper; sandy loam; sp. grav. 2·280. No. 25 is the subsoil of 22 and 24; loamy; sp. gravity 2·440. No. 26 is from the gate north of the old house beyond the valley; red clay, specific gravity 2·400.

Another important branch of Agricultural Science relates to the composition, value and use of the different manures. I have obtained a few results, which I submit for your consideration. I made five analyses of the ashes of farm-yard manure, prepared by Mr. George Jones in the usual way. The pen was covered, whenever it was necessary, with corn stalks, wheat and oat straw, and particularly with leaves.

TABLE No. 1.—Farm-yard Manure.

COMPOSITION.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	Av'rge
Carbonic acid	3·50	2·70	3·20	3·25	3·10	3·15
Sulphuric acid	1·55	1·30	1·10	1·60	1·00	1·31
Phosphoric acid	3·00	3·15	2·80	3·40	3·25	3·12
Lime	4·75	5·00	4·60	4·80	5·30	4·89
Magnesia	2·80	3·10	3·00	3·40	2·90	3·04
Alkalies	2·50	2·80	2·90	2·85	3·00	2·81
Silica	78·00	78·00	78·75	77·10	77·50	77·87
Common salt	1·05	1·10	1·11	1·11	1·15	1·104
Alumina and oxide of iron	2·10	2·25	2·30	2·27	2·41	2·266
	99.25	99·40	99·76	99·78	99·61	99·56
Loss	0·75	0·60	0·24	0·22	0·39	0·44
Total	100·00	100·00	100·00	100·00	100·00	100·00

The most important questions connected with Scientific Agriculture are the following: 1. What is the composition of the soil? 2. What is the composition of the crops growing on it? 3. What is the composition of the various manures? 4. What are the relations existing between the soil, crops and manures by a knowledge of which it would be easy to adapt the manures to the soil, and the soil to the crops in the most economical and profitable manner?

It is necessary that the first three questions should be answered before the fourth can be undertaken. In the present state of Agricultural Science we can only prepare materials, state facts which may assist, perhaps, in answering, hereafter, these important questions. If I have obtained one fact that may be used for this purpose, I shall be fully compensated.

With soils varying in their composition almost every step you make, with manures as changeable as the means of their formation, and with crops differing in their natures with the soil, manure, the period of their growth and the season of the year, it is not easy to answer the least important of the inquiries above mentioned. Many facts and much investigation are needed, and every fact clearly ascertained will assist.

The relations between Geology and Agriculture are beautifully illustrated in your County. The principle is everywhere manifest, that the nature of the soil depends on the nature of the rocks beneath. The sandy soil at Mr. Hall's arises from the granitic rock, in which quartz predominates; the strong, black, enduring soil of Dr. Tignal Jones's home plantation is derived from the granitic and sienitic rocks in which hornblende predominates—a soil that cannot be exhausted with proper management so long as the rocks endure. Butcher's Creek is distinguished by a hard clay iron soil and hard clay iron rocks. At the College, yellowish-white argillaceous rocks give rise to a poor, aluminous soil, better suited to the manufacture of bricks than to the growth of plants, but easily improved with lime and ma-

nure. The same principle is manifest at the Buffalo Springs, in the vicinity of Abbeville, at Lombardy Grove, St. Tammany, Drapersville, and in every part of the County. But I cannot pursue this inquiry.

I have no leisure to make any deductions from the facts stated in this Essay, but I leave them with you for consideration. It is a source of unfeigned regret that circumstances will not permit me to carry out fully the purpose I had cherished of exploring your County, classifying its various soils and forming a map representing the nature of the soil and showing the sources of your agricultural wealth.

Mecklenburg is a large County, with much fertile soil, capable of supporting twice its present population. With appropriate husbandry its citizens will be as near *El Dorado* as they are likely to be in any section of our country. Let the *plow* be driven, and the grateful soil will yield its increase. The *plow*, directed by *enterprise, skill and knowledge*, shall do here what it has done elsewhere, renovate your soil and multiply threefold its productions.

"Bread in its furrow springs,
Health and repose it brings,
Treasures unknown to Kings—
God save the Plow!"

Yours, respectfully, J. W. HARDY.

WHAT NEXT?—The distinguished Editor of the London Gardeners' Chronicle advises his readers that Mr. Milton, of Great Marylebone-street, has contrived an apparatus for *etherizing bees*, which does its work admirably, without the least trouble. The bees are at first much agitated, then stupefied, and fall to the ground, when they may be handled with impunity. The effect is produced in little more than a minute and a half.

PRICES CURRENT.

[*Corrected, January 22, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '48	℔ 100 lb.	5 75	@— —
Pearls, 1st sort, '48		7 —	@— —
BEESWAX—American Yellow		— 22	@— 24
CANDLES—Mould, Tallow	℔ lb.	— 12	@— 14
Sperm		— 32	@— 33
COTTON—From	℔ lb.	— 7	@— 10
COTTON BAGGING—Kentucky		— 15½	@— 16
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 9
Sheetings		— 6	@— 15
FEATHERS—American, live		— 32	@— 35
FLAX—American		— —	@— 9
FLOUR & MEAL—Genesee, pure, bbl.		6 25	@ 6 37½
Genesee, from Western Wheat		6 06¼	@ 6 12½
Troy		6 —	@ 6 06¼
Oswego		— —	@ 6 —
Michigan		6 —	@ 6 12½
Ohio		6 —	@ 6 12½
Brooklyn and New-York		— —	@ 6 —
Brandywine		6 50	@— —
Georgetown		— —	@ 6 50
Baltimore, Howard-street		6 25	@ 6 37½
Richmond City Mills		— —	@ 7 50
Richmond Country		6 37½	@— —
Alexandria		6 25	— @ 6 37½
Fredericksburg, Petersburg City		6 37½	@— —
Rye Flour		4 25	@ 4 50
Corn Meal, Western and State		3 12½	@ 3 18¾
Corn Meal, Jersey		3 25	@ 3 37½
GRAIN—Wheat, White	℔ bush.	1 35	@ 1 40
Wheat, Red and mixed		1 25	@ 1 33
Rye, Northern		— —	@— 90
Corn, Jersey and Northern yel		— 74	@— 75
Corn, Southern, yellow		— —	@— —
Corn, Western, flat yellow		— —	@— 73
Oats, Northern		— 48	@— 50
Oats, Jersey		— 42	@— 45
HAY—North River in bales,	℔ 100 lb.	— 72	@— 80
HEMP—American, dew-rotted	ton	120	—@140 —
" " water-rotted		160	—@190 —
HOPS—1847		— 5	@— 6
IRON—American Pig, No 1		— —	@— —
" Common		30	—@32 50
LIME—Thomaston	℔ bbl.	— 85	@— 90
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35	— @ 40—
Boards, Albany Pine	℔ pce.	— 10	@— 19
Plank, Georgia Y. Pine.	℔ M. ft.	27 50	@30 —
Staves, White Oak, pipe.	℔ M.	60	— @— —
Staves, White Oak, hhd		45	— @— —
Staves, White Oak, bbl		33	— @35 —
Staves, Red Oak, hhd		28	— @32 —
Hoops		27	— @32 —
Scantling, Eastern		17 50	@20 —
Scantling, Oak		30	— @35 —
Timber, Oak	℔ cubic foot	— 22	@— 25
Timber, White Pine		— 18	@— 22
Timber, Georgia Yellow Pine		— 30	@— 35
Shingles	℔ bunch	2 50	@ 2 75
Shingles, Cedar, 3 feet, 1st quality		28	— @34 —
Shingles, Cedar, 3 feet, 2d quality		27	— @32 50
Shingles, Cedar, 2 feet, 1st quality		20	— @25 —
Shingles, Cedar, 2 feet, 2d quality		18	— @22 —
Shingles, Cypress, 2 feet		18	— @22 —
Shingles, Company		35	— @38 —
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 14
Cut 4d to 40d		— 4⅜	@— 4½
PLASTER PARIS—	℔ ton	2 50	@— —
PROVISIONS—Beef, Mess,	℔ bbl.	8 25	@ 9 —
Beef, Prime		5 50	@ 6 —
Pork, Mess, Ohio, old		10 —	@10 25
Pork, Mess, Ohio, new		11 75	@ 12 —
Pork, Prime, Ohio, old		6 50	@— —
Pork, Prime, Ohio, new		7 62½	@ 7 75
Lard, Ohio, new	℔ lb.	— 7¾	@— 8¼
Hams, Pickled		— 7	@— 7¼
Hams, Smoked		— 9½	@— 11¼
Shoulders, Pickled		— 4	@— 5¼
Beef Hams in Pickle		— 9	@10 50
Beef, Smoked	℔ lb.	— 6	@— 6½
Butter, Orange County Dairy		— 19	@— 21
Butter, Western Dairy		— 14	@— 16
Cheese		— 6	@— 7
SEEDS—Clover	℔ lb.	— 7	@— 7¼
Timothy	℔ tierce	15 —	@18 —
Flax, Rough		— —	@— —
SOAP—New-York	℔ lb.	— 4	@— 7
TALLOW—American Rendered		— 8	@— 8¾
TOBACCO—Virginia	@ lb.	— 2¾	@— 7½
Kentucky and Missouri		— 4	@— 7½
WOOL—Am. Saxony, Fleece,	℔ lb.	— 42	@— 47
American Full Blood Merino		— 38	@— 40
American ½ and ¾ Merino		— 33	@— 36
American Native and ¼ Merino		— 28	@— 30
Superfine, Pulled Country		— 33	@— 35

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MISCELLANEOUS NOTES AND EXTRACTS

ON A VARIETY OF SUBJECTS.

An absence, longer than usual at this season, has brought an accumulation of agricultural contributions, in various forms, which, as yet, we have not had time to examine, much less to digest. It will need some share of diligence to look it over and turn it to account, before a fresh supply will come to demand the same attention.

We do not know how a few pages may be occupied in a manner more likely to entertain and benefit the reader, than by stringing together, as we go along, such items as may appear to be adapted to the season, and to the circumstances and uses of the greatest number of our patrons. With these objects and considerations in view, it will be allowable just now to say more about the *Potato* than has been our custom, since of all esculents there is none so universally cultivated, and moreover the time for planting for early use is at hand.

We may begin by premising that a gentleman lately informed us that, whatever doubts may, and certainly do, still exist as to the cause of the Potato malady—in the neighborhood of Philadelphia, where the subject has so attracted particular notice as to lead to some investigation, there are some points which experience appears to have settled as tending to give a better chance of a saving crop—as, for instance, liberal manuring, and *early and deep planting.*

Mr. Gowan, the well and widely known patron and exemplar of agricultural improvements, has given particular attention to this subject, and it is said made, last year, a crop of 1,500 bushels of the finest quality. Our informant stated that he had lately refused $500 for 500 bushels. Supposing an acre to be sufficiently well manured to produce 60 bushels of Indian corn, may it not be said that it would yield 200 of potatoes? The former at 60 cents would be worth $36 to the acre, while the latter at $1 would yield $200. Now who will give us a calculation as to the difference in the labor and cost of cultivation and transportation to market, so as to arrive, as nearly as may be, to the net profit? As a general thing it would, perhaps, not be safe, however, to count upon more than 100 bushels of potatoes to the acre, nor on a price exceeding 50 cents on the farm.

As, however, the Potato disease was extensive the past season, and appears to be spreading southward in the United States, it may be useful to many to learn the result of experience as we find it detailed in the papers before us.

The first communication is that of a writer who relates in the London Gardener's Chronicle:

"For the last three years, during which time the Potato crop has been so extensively affected by the prevailing disease, my attention has been drawn to a method of cultivating that plant, practiced by a gentleman whom I have known for the last 20 years to have been a large and successful grower. His *unvarying success* can evidently be attributed to nothing more than the strict observance of a few simple rules of cultivation. In the first place, he has been very particular in selecting and retaining only such sorts as arrive at early maturity, and are of superior quality; also such as are not liable to rot *after cutting* (for he divides his sets), thereby planting double the breadth of land with an equal measure of tubers. They are planted in rows which are 26 inches apart; the sets 1 foot distant from each other. The time preferred for planting is from the second week in February to the last week in March. They are deposited 3 inches deep from the surface of the land, and then immediately earthed up on one side to the hight of 4 inches, leaving the *sets 7 inches buried* (by this method the wet is drained off from the sets, which are also well secured from frost). At the end of April or beginning of May, according to the variations of the seasons, the rows are leveled down by means of a harrow or rake, and, after the potatoes become sufficiently strong, they are moulded up in the usual way. I may add that he is not an advocate for early digging; he generally leaves them in the ground till late in autumn. His plan of storing is to have them placed in very narrow ridges on the surface of the ground, banked up with earth, and well covered with straw or fern; and by this plan fermentation is in a great measure obviated.—By the observance of the above rules this gentleman has been enabled to obtain, during the last three seasons, crops as abundant and fine as the same land, on an average, ever before produced; and this present season he has produced a crop of 1,400 sacks of sound potatoes from 21 acres of land; his usual quantity of seed is 4 sacks per acre. MARTIN MAYES.
Durdham-down Nursery, Bristol."

There is one objection to drawing inferences from English accounts, to influence American practice, which floats on the surface and is so apparent that the dullest vision may see it—arising from *difference of climate*. Now, though that may teach us that Carolina is not much better adapted to turnips than England to sweet potatoes, yet it does not warrant the conclusion that the same causes which produce the Potato rot in England would not produce it, where they are present, in the United States, nor forbid us believe that a remedy or preventive in one country would prove equally effectual in the other.

The objection we should make, or the doubt which arises to the suggestion of this writer, is, in our judgment, to the gentleman's practice in cutting his potatoes in sets or slips. Although experience has proved, it seems, that they do well, may it not be reasonably believed that whole potatoes would do better, to at least the amount in the difference in the expense of seed?

Here, in this extract, we encounter again a perplexity (which it has been our aim as much as possible to obviate), arising from the *difference in our and in English weights and measures*. On this point of uniformity in weights and measures, as well as in simplicity and uniformity of language, and freedom from provincialisms, we seem to have made more progress than the "mother country," where the greatest diversity and confusion prevail.—How much is a "*sack*"? says the reader, wishing to see how many bushels are considered a fair crop of potatoes in England.

Turning, then, to a little book of reference, much of which will be copied in our journal, we find the following Table. By a late act of Parliament, the legal stone is in all cases to consist of 14 pounds avoirdupois; 8 such stone 1 cwt.; 20 cwt. 1 ton. In wheat measure a *sack* is four bushels.

	Cwt.	qrs.	lbs.		Cwt.	qrs.	lbs.
8 pounds 1 stone.*				6½ tods 1 weyt	1	2	14
14 pounds 1 stone†	0	0	14	2 weys 1 *sack*†	3	1	0
2 stone 1 todt	0	1	0	12 sacks 1 lastt	39	0	0

At this rate, 1,400 sacks were equal to 509,600 pounds of potatoes—which, divided by 21, the number of acres, and that again by, say, 50, for the pounds in a

* Used for meat. † Used in the wool trade.

bushel of potatoes, and we have 485 bushels to the acre. Here, again, as it is said constant dropping weareth away stones, a line may be taken to urge the propriety of municipal, if not legislative measures, to cause all common marketable commodities to be *sold by weight*—even ducks and chickens should be so sold.

It has often been a matter of amusement, less than surprise, to find how a very large proportion of practical farmers may be confounded by putting to them questions which their every-day transactions require that they should be able to answer at a word. There is, for instance, not one in twenty that can tell the ordinary weight of a bushel of potatoes or buckwheat, or of a horse-cart, or a bushel of oysters. Yet for many and obvious reasons they ought to know the ordinary weight of everything to be transported on or from their farms upon the road.

The following Tables may be of some practical use to a greater number than may be willing to acknowledge it. By-the-by, we would recommend every farmer to keep a *scrap-book*, in which everything of this sort which he meets with in *his party* newspaper (and many neither take nor read any other) might be pasted and preserved. Let it be paged and given in the keeping of the good housewife, who, on the least hint, with her ever ready scissors at her side, will cut out what is indicated, and paste it in the book; and then the farmer himself, or his son, some rainy day, when kept from school, can make an *index* according to the subject, so that any particular matter may be readily referred to. But here are these homely Tables:

ST. LOUIS WEIGHTS OF PRODUCE.—NUMBER OF POUNDS AVOIRDUPOIS TO THE BUSHEL.

Wheat 60	Flax-seed 55	Buckwheat-seed 52
Beans, except Castor Beans. 60	Barley 48	Castor Beans 46
Clover-seed 60	Oats 35	Hemp-seed 44
Potatoes 56	Onions 57	Blue-Grass seed 12
Rye 56	Dried Peaches 33	Timothy-seed 45
Corn 56	Dried Apples 24	Salt 50
Bran 20		

One bushel of Charcoal shall be equal to five pecks.
One bushel of Lime shall be equal to five pecks.

The reader will, of course, understand that these are *standard* weights; and, when the article really weighs more or less, the payment is regulated by this standard.

A Valuable Table.—The following Table, compiled from the calculations of J. M. Garnett, Esq., of Virginia, will be found exceedingly valuable to many of our mechanical readers:

A box 24 inches by 16 inches square, and 22 inches deep, will contain a barrel, or 10,852 cubic inches.

A box 24 inches by 16 inches square, and 11 inches deep, will contain half a barrel, or 5,426 cubic inches.

A box 16 inches by 16·8 inches square, and 8 inches deep, will contain one bushel, or 2,150·42 cubic inches.

A box 12 inches by 11·2 inches square, and 8 inches deep, will contain half a bushel, or 1,075 cubic inches.

A box 8 inches by 8·4 inches square, and 6 inches deep, will contain one peck, or 536·1 cubic inches.

A box 8 inches by 8 inches square, and 4·2 inches deep, will contain one-half peck, or 267·0 cubic inches.

A box 7 inches by 4 inches square, and 4·8 inches deep, will contain half a gallon, or 131·4 cubic inches.

A box 4 inches by 4 inches square, and 4·2 inches deep, will contain one quart, or 67·5 cubic inches.

To return to the potatoes—it seems to be understood that pains should be taken, in putting them away, to secure them not only against *wet*, but against the *heat* that proceeds from too large a bulk, and which promotes fermentation

and vegetation, and of course exhaustion before planting. We understand that the deep planting recommended in the English extract is confirmed by Mr. Gowan's experience.

We shall doubtless meet with other practical hints on this subject as we go along, looking over the journals before us.

Entomological Societies.—Nothing has so much tended to promote progress in arts and industry, as the *division of labor*—the confinement of attention to a single branch; but there is in this respect great room for improvement in our country. Instead of having separate associations for the increase of knowledge in each branch of natural science, and in each art and industry, we undertake so many at once that nothing is half done.

Thus we have one society to exhibit and give premiums for sheep, and cattle, and fowls, and flowers, and plows, and bridles, and all sorts of products and manufactures—instead of dividing these objects, and carrying them all to a much higher state of melioration. We ought to have, for example, Veterinary Societies, for the improvement and care of the Horse—Societies expressly for the exhibition and improvement of Sheep and Wool—for the Grape Culture and Manufacture of Wine—and various other things. Why not, particularly it may be asked, an *Entomological Society?*

We are reminded of this at the moment by seeing, in the paper already referred to, the following—which shows that we may go to London for a better knowledge even of the insect destructive to our own great Southern staple; and that a Society *there* is taking measures to have observations made on its habits, by a citizen of still another country in Europe, now traveling in the United States! Is it that nothing has attraction for us, with all our vain-boasting, that may not be *at once* converted into the almighty dollar, unless it be *military* glory!

"*Dec.* 6.—W. Spence, Esq., F. R. S., President, in the Chair. Mr. Spence communicated a note from Rev. Mr. Meadows, of Witnesham, near Ipswich, accompanied by specimens of *Bruchus granarius*, which has proved especially destructive to crops of green Mazagan Beans in Suffolk, at least one-third of the crop being attacked in some places. He also stated that the Turnip crop had suffered to a great extent from the ravages of the grub of *Agrotis segetum*—adding that part of a field, which had been dressed with "*burnt earth*," at the rate of about 60 cart-loads to an acre, had *entirely escaped;* but that the remainder of the field, manured with London manure at the rate of about 20 cart-loads to an acre, had been greatly attacked.*

Mr. Spence read a note relative to several species of insects which infest the *Cotton crop* in North America, and suggested that the subject was very worthy of the attention of entomologists—nothing definite having been hitherto recorded, and the successful cultivation of the crops of that article having so great an influence on the prosperity of our manufacturers, and that more especially since vigorous attempts were now making to grow the Cotton in our Indian territories (the plants being introduced from America). It was, therefore, resolved that the celebrated entomologist, Dr. Schaum, now in North America, should be requested to direct his attention to the subject, on behalf of the Entomological Society."

Effect of Turnips on Ewes in Lamb.—Mr. Robinson (Veterinary Professor in England) asserts—and his assertion seems to have attracted much notice—that "when lambing-ewes are allowanced a large quantity of turnips with a small amount of other food through the winter, abortion is a frequent occurrence; their supply of milk is very deficient, and their lambs are dropped of various sizes and far from healthy. If the ewes are allowed free access to salt, the lambs are still more unhealthy, and many die of indigestion and disease of the liver. The mortality of the lambs in these cases may, I think, be fairly attributed to the amount of salt taken by the dam; for admitting that a small portion only is directly given them, the quantity positively taken in their food in turnips is somewhat considerable." A Lincolnshire flock-master remarks on the above: "According to this it would appear we

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* See Gardeners' Chronicle, 1847, p. 442, for another instance in which a difference of manure operated as a check against the attacks of insects. Entomologists and agriculturists have not hitherto studied the effects of manures upon insects so carefully as is evidently necessary.

have been on a wrong system, and I am not quite so sure but to a certain extent this is so. Last lambing season vast quantities of lambs died, and ewes also in this county, but it was generally supposed to be the distemper, a disease that has been in this county to a fearful extent. Many persons last season, probably on account of the distemper, gave an increased quantity of salt to their flock, from an idea that it would check the distemper, which may in fact have destroyed both ewes and lambs, according to Mr. Robinson's theory. At all events it is a subject well worthy of consideration and discussion, and I trust these few remarks may attract the eye of more experienced persons than myself. If it shall be shown that this assertion of Mr. Robinson is right, and that turnips are injurious to a breeding-flock, the sooner the present system is abandoned the better, and corn or oil-cake must be given in lieu. I should add that the Swede turnip is usually pitted for lambing time, and the red and white tops consumed during the winter season."

Exhibition and Trial of American Implements in England.—*Society of Arts*, December 8, T. Hoblyn, Esq., in the Chair. Mr. Slocum exhibited two plows, a scythe and cradle for reaping corn, a grass-scythe, three spring-tempered manure and hay forks, a cast-steel hand-hoe, and an ax of American manufacture. He stated the peculiarity of these implements to consist in their lightness, cheapness and durability, thus enabling the agricultural laborers to accomplish a larger amount of daily work at a less cost. The implements he exhibited were such as are commonly used in the United States. A letter was read from Mr. Love, of Manor House, Naseby, in which he states the plows were tried on a clay soil in rather a dry state against Adams's Northampton plow and one of Howard's Champion plows. Howard's, when working five inches deep by *eleven inches wide*, had a draught of thirty-one stones, and Adams's plow, at the same width and depth, a draught of thirty stones, while the American plow, at five inches deep and *fourteen wide*, drew only *twenty-six stones*. "In justice to the American plows, I must say," observes Mr. Love, "that they cut up and cleaned their furrow quite as well as the other plows, and also turned the earth completely, breaking it and putting the soil in capital position for drilling or dibbling; they are the most simple, strong, light and effective plows it is possible to conceive." Other experiments were also made, and the draught tested by the dynamometer. The cost of the plows Mr. Slocum stated to be £2 each.

Perhaps this may fall under the eye of some one who can tell from what manufactory the American implements, and particularly the plow, were sent.

It is believed that Mr. Colman was once present at a trial of American and English plows, where the decision was in favor of the latter. It were to be wished that our Societies would invite Mr. Ransome, the great improver and manufacturer of the best English plows, to send over one or more to be tested against the best American, such as are turned out from Prouty's or Ruggles & Nourse's establishments. Although not so attractive and exciting to the crowd at a Cattle-Show, as Tom Thumb and the monkeys, fat stallions and cows with three calves, musicians, and sheep with four horns, and other live animals, *improved implements* constitute everywhere the most valuable department, and deserve the continued and especial favor of all well-directed associations and efforts to promote improvements in American Husbandry; and truly the improvement has been wonderful, even within our recollection.

Guano.—The writer of these notes distributed two barrels of Peruvian guano in Maryland twenty-five years ago, and endeavored to spread a conviction of its value, by giving translations from Ulloa & Humboldt to show its efficacy and the manner of using it. It was admitted by one gentleman to be a powerful fertilizer, but nothing was done toward obtaining any farther supply. Now see what has been the progress in the use of it in England:

	Ships entered.	Tons.		Ships entered.	Tons.
In 1841	7	1,733	In 1843	13	4,056
1842	41	12,000	1844	286	81,902

In 1845 .....679 ships entered, with 219,764 tons.

We have no particulars before us coming down to this time. Guano is known to be the excrement of sea-fowl, deposited by them on many of the rocky islands of the Pacific and Atlantic during the breeding-season. Its price last year in England was quoted: Ichaboe, $30 to $40 per ton; Peruvian, $50 to $52,

according to quality. It varies in composition, and here, where we do not possess the science or the energy among agriculturists to provide for the scientific analysis of it, it is probable we are shabbed off with that of inferior quality. In Maryland, owing to the forecast of Mr. Naill, of the Senate, an Inspector has been appointed to examine that which is sold in the Baltimore market. In the House of Delegates of that State, Mr. Coad has moved to have an Agricultural Chemist appointed, but it would probably be much easier to get a Drill-Sergeant or a drummer and fifer to go through the counties, especially if dressed off in showy regimentals. The guanos of commerce have been analyzed in England by Professor J. F. Johnston. He found in these—

Kinds.	Water.	Ammoniacal matter.	Earthy phosphates.
Peruvian	7 to 9	56 to 66	16 to 23
Chilian	10 to 13	59 to 46	22 to 30
Bolivian	6	65 to 64	25 to 29
Ichaboe	18 to 26	36 to 44	21 to 29
Saldanha, light	17 to 27	14 to 22	43 to 56
-- dark	33 to 44		
Algoa Bay	2·26	22·37	70·20
	23·93	23·16	43·15
Halifax	24·47	20·61	22·67
Bird's Island	25·49	19 to 21	22·43
-- --	14·18		5·37
Patagonian, light	40·99	20 to 25	24 to 32
-- dark	20·55		

Guano is undoubtedly a powerful manure when applied at the rate of from 300 to 500 pounds per acre, especially in wet seasons, and on moist soils.

A New Plant, adapted to the United States, called the "Dyer's Buckwheat."—At the same meeting of the Society of Arts, a communication was read from Mr. W. Taylor, F. L. S., &c., on the Cultivation of *Polygonum tinctorium*, or Dyer's Buckwheat:

"This plant," observes Mr. Taylor, "is a native of China, and was introduced into England in 1776 by John Blake. It is used in China and Japan for the purpose of dyeing a blue similar to that of the finest indigo. The color is obtained from the leaves of the plant, which are dried, pounded, and made into cakes. With these cakes, Thunberg says, they dye linen, silk and cotton. When the cakes are boiled, they add ashes, and the stronger the decoction is made, the darker the color. The plant grows best in England on soils of a medium texture, which must also be well manured before the seed is sown, which is best sown in rows about the middle of April. Two pounds of seed to the acre is sufficient, but the plants may be planted out in rows from the hot-bed, at the rate of 16,000 to the acre, and unless they are brought forward and planted out, they will not produce seed in England. The plant can be prepared for the market in three ways, viz.: 1st. It may be cut in a green state, and sold to the dyer, in which case an acre would produce 5 tons of leaves and stalks, worth about £30. 2d. If cut and placed in vats, so as to precipitate the 'fecula or indigo,' the acre would produce 3 cwts. of color, which at 1s. per lb. would be worth £16 16s. 3d. The plants may be cut up, dried, and packed in bundles; the acre would then yield 3 tons of dyeing matter, and be worth about £21. The coloring matter may be extracted by fermentation or scalding." Specimens of the plants and color were exhibited."

Here is another opportunity for the active vigilance and enterprise of the American Institutes to render, in all probability, an important service to the country. Their ever-wakeful "*Committees of Importation*," looking out for new plants and new implements, (for which the whole habitable globe is explored by European Societies,) will no doubt have ordered, through their alert agents in England, a few of the seed of this "*Dyer's Buckwheat*"; for if it *can* be matured to produce seed by the management described in England, it would doubtless succeed in all our Southern States. The preparation would seem to be very simple—cutting, drying and packing—and if, instead of yielding from $100 to $150 an acre, as stated, it should produce even the lowest sum named, $80, it

might be made to supersede profitably many of our products, and the more we can diversify these, the more remunerating the product of them all.

Nothing of this kind should be allowed to escape the vigilance and energy of institutions acting in the name of the whole Union and, as such, supplied with ample funds, which, instead of being hoarded up, should be kept constantly employed. Though many things thus imported might prove to be without value, yet in a single case it would sometimes happen that more good would be done than by volumes of translations from Spanish, and Greek, and Latin, and French, of olden or of modern times, which better serve for display than real utility.

USE OF INDIAN CORN AS FOOD FOR STOCK IN ENGLAND.—The best opening, in our view, at present, for a great increase of demand in Europe for our great staple, *Indian Corn*, is in the prospect of having it take the place, especially in England, of *oil-cake* and other food, so largely employed there for feeding cattle. It is every way worthy of the attention of the many who are directly interested in the solution of the question. What is wanting is to find out, with all practicable exactness, at what price, per hundred or per ton, the two articles will meet each other, in competition, in the hands of the English farmer—then the nutritive and fat-making properties of each—and finally, the value which each imparts to the manure—a point which *English* Farmers look at with becoming solicitude.

Unfortunately, as to the nutritive qualities of a staple of which the last year we produced more than 500,000,000 of bushels, we have no school or scientific *agricultural* institutions, to which we can go to have that question settled with accuracy; nor at which we can learn, as in England, how much the use of any particular food will augment the value of the manure produced by it. But if, by any means, we could connect such investigations with the art and *purposes of war*, the Government provides amply for that. To the representatives of the *landed interest* in Congress there is nothing so exhilarating, no stimulus to legislative action so powerful, as the sight of a glittering epaulette, the roll of the drum, the shrill music of the "ear-piercing fife," and the smell of human blood—nothing which so quickly prompts them to bestow all the means of scientific instruction to cause analyses and surveys to be made and mapped, to give instruction, life-commissions, large salaries, the choice of the public lands, and liberal pensions to wives and children. Eighty per cent. of the public burdens, willingly borne—nay, self-imposed—by this besotted nation, and that in time of peace, is for *warlike purposes*, and no public man can be found to move in the way of investigation or reform of such a prostitution of all the purposes of rational and enlightened Government.

But to return to the mode of feeding cattle in England and the food used there, with which our corn-meal would have to come in competition. At a late meeting of one of their Agricultural Societies, their system of *box feeding*, which is highly spoken of, and fast getting into use, was thus described:

At a recent meeting of the Cornwall Agricultural Association, at Truro, Mr. Karkeek, of Truro, gave the following useful information. He stated that that Mr. Trethewy, Mr. Tresawna and himself went out to Mr. Davey's farm for the purpose of seeing the method of feeding cattle lately introduced there. The farm was taken in by the Messrs. Davey but a few years since, from the common at Tywarnhayle. The plan consists in feeding cattle in loose-boxes, on a compound of linseed and rye-meal, prepared as follows: 23 lbs. of crushed linseed is gradually mixed with 21 gallons of boiling water in a copper; after which, 84 lbs. of rye-meal and a handful of salt are added. The mixture, having been well stirred, is cast into moulds, forming cakes of 7 lbs. each. The quantities of ingredients above mentioned will make thirty-six cakes, and the whole can be manufactured by a man and two girls in

about one hour. One of these cakes, with ¾ cwt. of Swede turnips, and a bushel of straw and hay chaff (which last is also mixed with linseed mucilage), is given to an ox in six meals per day. The method of preparing the linseed and chaff is by dissolving 12 lbs. of bruised linseed in 240 lbs. of boiling water; this is poured on straw, chaff, and hay, equal to fifty bushels, in a shallow cistern; while one person gradually pours the boiling mucilage over the chaff, another person turns and beats it with a beater till the liquid be perfectly absorbed. The expense of feeding an ox in the manner here described is about one shilling per day. The consumption of the compound is gradually increased in quantity. Some feeders give from 14 to 21 lbs. per day, being nearly in the same quantities that linseed-cake is given. The advantages derived from the use of the compound over the oil-cake are very considerable. The oil-cake costs, on an average, from £10 to £12 per ton, while the linseed compound can be manufactured with either pea, bean, barley, Indian corn, or rye meal, at from 60s. to 70s. per ton. Again, from the various trials which have been made by practical farmers, of the feeding qualities of the two articles, the advantages are in favor of the compound, weight for weight. The utensils required for manufacturing the compound are a 30 or 40-gallon copper, a hand-mill for crushing the linseed (cost 50s.), a half-hogshead or two, half a dozen moulds, a hand-cup, a three-pronged fork, and a wooden rammer, the whole of which may be purchased for 30s. Mr. Karkeek next described the Messrs. Davey's system of box-feeding. Their boxes are about nine feet square, sunk three feet (two feet it is said is quite sufficient) below the surface in one continuous excavation, and having sliding bars between the boxes, and a sliding trough placed in the boxes for holding food and water. The bars and troughs are made to slide upward, as the manure accumulates underneath. Messrs. Davey's cattle had been placed in the boxes and fed in this manner for six weeks, up to Saturday, Dec. 4; and there was scarcely the slightest effluvia arising from the dung. From the constant treading of the cattle, the dung becomes so consolidated that at the end of three months, when it is removed, it is generally cut with a hay-knife into solid cakes about two feet square. The Messrs. Davey having tried the system only six weeks, cannot speak of its practical value; but from reports of practical farmers of the highest respectability, there is reason to believe that cattle may be easily fattened in this manner in four months; besides which there is the advantage of making a rich and valuable manure. Mr. Karkeek went on to say that, having some doubts respecting this method of feeding, he wrote to Mr. James Daubuz, of Offington, near Worthing, who had pursued the system for some time. Mr. Daubuz's reply was: "I purchased eight Devon oxen at Barnet Fair, on the 11th of September, 1846, at a cost, including expenses, of £98. The cattle were examined by a Cornish friend of mine, who pronounced them to be a very indifferent lot; they were in very moderate condition. They had the run of the stubbles till the 11th November, when they were put into the boxes and fed on the linseed compound, manufactured from linseed, tail-barley, and tail-peas: commencing only with half a cake per day for each ox, and finishing with three cakes—averaging two cakes per day They consumed, in this manner, up to the 15th of March,

Tail-barley, 7½ qrs., at 24s	£9	0	0
Tail-peas, 7½ qrs., at 36s	13	10	0
Linseed, 3 qrs., at 56s	8	8	0
Total	£30	18	0
Besides one bushel of steamed hay, half a cwt. of chaff, and one bushel of white carrots or Swedes each per day	10	2	0
Total	£41	0	0

They averaged on their sale £21 6s. 3½d., the total being £170 10s. 4d." Mr. Karkeek went on to observe that in using "compounds" of this kind, there was the additional advantage of being enabled to consume profitably on the farm a large quantity of offal corn which would otherwise be forced into the market, depreciating the value of good corn. Mr. Daubuz, for instance, fed the eight bullocks entirely on offal, barley and peas. In conclusion, Mr. Karkeek stated that Messrs. Davey had been growing their own flax on some of the land lately reclaimed by them from St. Agnes Common. The fields were four acres, and put into linseed and clover in April last. The crop of flax was a fair average, and that of clover was abundant. But, leaving growing of flax altogether out of the question (although there could be no doubt that it might be profitably cultivated, since it was found indigenous in the county,) there could not be a question of the importance of preparing a cheap material for the manufacture of beef and mutton, whether by cultivating linseed in this county, or by importing it, for the purpose of being formed into a compound with some of the farmer's home productions.

We learn, by a letter not written for publication, that a respectable and responsible gentleman in the West lately offered to an English firm at Cincinnati "to contract with them for 50,000 barrels of corn meal per year, delivered at New-Orleans at $2 25 per barrel"—the meal to be equal in quality to a speci-

men which had been shown to us in this city, which had been dried by Stafford's Patent Dryer, and to be so dried and bolted. The partner in the firm to whom the offer was made doubted the possibility of complying with the contract, without a heavy loss on the part of the person making the offer, who says to us: "To convince him, I gave him the following data: 4 bushels of merchantable corn at 25 cents is $1; barrel 30 cents; grinding and drying 10 cents; freight to New-Orleans 40 cents—say 50 cents—make $1 90; if subjected to charges of shipment from New-Orleans (which may be avoided by laying the flat alongside of the ship,) ten cents per barrel would be added; 70 cents freight to Liverpool is above an average. Thus a superior article of corn meal may be laid down in Liverpool, London, or any other of the ports of Great Britain or Ireland, at $2 70 per barrel. This is less than $30 per gross ton, while the nutritious properties of Indian corn meal are nearly double that of oil-cake." This may be so, but it would have been more satisfactory to have been referred to the proofs by analysis, if to be had.

We have been informed that meal dried by Stafford's Patent Dryer, has sold at two shillings and sixpence more per barrel in Liverpool than any other meal in the market.

We doubt not that a contract might safely by made on the basis of twenty-five cents a bushel for the grain, but, in that case, what becomes of the Farmer, if the following calculation be true, which we take from the Iowa Advocate, as information of some interest to *emigrants from the old to the new States:*

PROFITS OF FARMING.—We solicit the attention of Iowa farmers to the following statements. They are from the pen of a practiced farmer, Mr. Douglas Oliver, of Wisconsin. It will be observed that the price of corn is put much higher than the market in Iowa will warrant:

Profit on raising Corn at 25 cents per bushel.

For plowing the ground at 75 cents per acre, say 20 acres	$15 00
For barrowing, one time, 18¾ cents per acre	3 75
For furrowing it out to plant both ways, 33⅓ cents per acre	6 66
For seed-corn, 3 bushels, $1 per bushel.	3 00
For planting, 37½ cents per acre	7 50
For plowing, first time, 37½ cts. per acre	7 50
For hoeing, first time, $1 per acre	20 00
For plowing three times more, 37½ cents	22 50
For hoeing second time, $1 per acre	20 00
For husking and storing away, 4 cents per bushel	40 00
For hauling to market, 5 cts. per bushel	50 00
Rent of farm, one-third of crop, say	83 33
Cost of crop	$278 14
Cr. by crop, 50 bushels per acre, 25 cents per bushel	250 00
Loss to farmer	$29 14

Farmer's profit on raising Wheat at 50 cents per bushel.

For plowing ground at 75 cents per acre, say 20 acres	$15 00
For harrowing first time, 18¾ cents per acre, 20 acres	3 75
For seed-wheat, 30 bushels, 50 cents per bushel	15 00
For harrowing twice, and sowing, 37½ cents per acre	7 50
For harvesting and shocking, $1 50 per acre	30 00
For hauling and stacking, 50 cts. pr acre	10 00
For threshing, say 18 bushels to the acre 12½ cents per bushel and storing away	45 00
For hauling to market, 8¾ cents pr bush.	30 00
For the rent of farm, one-third	53 33
Total	$209 58
Cr. by 360 bushels of wheat, 50 cents per bushel	180 00
Loss, when a farmer hires work done	$29 58

BEES.—Mr. Robert Reid, baron officer of Hon. M. Stewart. Corsbie, Scotland, having two hives of bees, the one pretty strong and the other weak, took it into his head to make an experiment with the weakest, as it was not worth killing. He shut up the mouth of the "skep," covering it with straw, after covering the whole with earth in the same manner as a pit of potatoes. The strong hive, during winter, took for its sustenance upward of ten pounds of sugar. When dug up, wonderful to behold, the formerly weak hive was found in a strong and healthy state. The "skep" was lifted off the board, and there were not above a dozen dead bees in the lot; and it was truly pleasing to see them when aroused from their dormant state, flapping their wings and buzzing about, after being shut up from light and air four months and thirteen days. About two hours after being opened, they were out in swarms busily gathering wax.

BOOK KNOWLEDGE IN FARMING.

We have elsewhere expressed our belief that the habit of reading and reflecting on the principles of Agriculture is nowhere in our country more general than in the Middle and Southern and Atlantic States. In an Address conceived and couched in the finest tone of morals and philosophy, lately delivered at Columbia, S. C., before the State Agricultural Society, by R. F. W. Allston, and published by order of the Society, he says

"But with regard to the use of books I must affirm that if, in this State, the present generation, and those preceding it for a century past, had been denied, in farming, the lights which *have been derived from the Press*, we should now be *nearly a century behind the age* in which we live, instead of occupying, as we do, a creditable place in rear of those who are foremost in Agricultural Science—in the use of labor-saving machinery—in the knowledge and use of the various powers by which necessary results may be produced in the best manner and the shortest time."

He recommends every farmer to take an agricultural paper, and adds, as to the

Life and Character of the American Farmer—"I feel bound to suggest that the practical Farmer, the successful and thriving Planter, generally reads too little—far too little—considering his leisure. Next to the contemplation of the infinite perfection of Deity, nothing tends more to enlarge and liberalize the mind of Man than intimate communion with the wise and good of his kind, either personally or by means of their writings. Few causes will serve so well to divert the anxious soul from the fretting cares and vexatious incidents of a busy life, as a familiar acquaintance with the virtuous traits of men of olden time, a relish for the history of by-gone days, or the occasional tracing of those developments in Nature, and of Science, which so admirably serve to demonstrate the moral progress of Man, to illustrate the power and excellence of his genius, and so materially to aid in consummating the great conquest of mind over matter.

"A taste for reading comes by teaching and example. If the mother of a family possess such a taste, (she may cultivate it without at all interfering with her domestic duties,) the daughter, in all probability, will imbibe it. Should the father happily be in the habit of occupying with books his leisure time, the son will seldom fail to be instructed, and ultimately to be led, by the example. Thus, in geometrical progression, how many sons, how many daughters, may not be trained by the joint precept and example of a considerate and virtuous couple, to an innocent and most useful habit—a habit which will prove a wholesome refuge in times of temptation and danger—an invaluable resource in seasons of trouble and disappointment, and in the dull evening of life.

"A plain elementary education at school will accomplish much that is necessary; it is the only kind likely to be universally diffused. In this view, how important becomes the successful administration of our system of Free Schools! a system which, however little good is effected by it, under present auspices, does infinite credit to the hearts of the wise statesmen by whom it was conceived and founded. Here the child of the most indigent may learn to read to his unlettered father a rule of practice in Farming or Mechanics, which may save him a world of doubt, perplexity and labor. And here another may be taught to minister to the care-worn, heart-stricken mother a solace for her untold griefs, to point to a home of refuge from her sorrows, by opening the Book of Life and tracing on its pages the unfailing promises of God."

India-Rubber.—It is well known that India-rubber has been substituted for steel springs in railcars and carriages. It is now found that railroad wheels, even for freight-cars, are greatly improved if cast double, so as to admit a layer of India-rubber between the two parts, one being within the other, which greatly lessens the heavy jarring occasioned by concussion on the rail.

Whey for Cows.—The Herkimer dairymen give their whey to the cows, finding it more profitable than to feed it to their hogs. Most cows eat it greedily.

AGRICULTURAL DINNER AT SIR ROBERT PEEL'S.

At the risk of being considered too prone to look abroad for information (and where would we not look for the best to be had?), we have decided to lay before our readers at least a good portion of what we find, in a late London Agricultural Gazette, of an *agricultural dinner party* given by Sir Robert Peel.—By-the-by, we could not help wishing for the pleasure of partaking, though it were but as a silent partner, the intellectual festival, which must have been so enjoyable, at the late meeting of the Trustees of the Massachusetts Agricultural Society at *Marshfield*--for, without any wish or motive to flatter, we doubt if it would be easy to find, in any country, Mr. Webster's superior in clear conception of the true philosophy of any branch of Agriculture to which he may have at any time turned his attention—so truly *Baconian* is the cast of his mind.

While all that passed at Sir R. Peel's dinner, where conversation was strictly confined to agricultural topics, is worthy of attention, as being more or less applicable to our own country, the testimony as to the profitable effect of *draining* is quite remarkable; and, as the learned English Editor says, especially that feature of these operations which relates to the drainage of 100 acres of Drayton Meadows, on the banks of the River, on a dead level, and *subject to annual flooding, sometimes of two feet.* The whole of this, says Professor Lindley, has been drained 4 feet deep; and, although the flooding is not thus prevented, the consequences of the floods are converted from an injury into a benefit—for the moment the waters subside, the superfluous moisture passes off with great rapidity, all the matters suspended in the overflow being left in the ground, which acts as a filter. It is "like the inundation of the Nile." We presume that everything on the subject of draining must have interest for many readers, and especially for our numerous and valued friends in Louisiana. To us it appeared, on a very cursory view of their country and tillage, that to divest their soil more completely of its *surplus moisture* must be a great desideratum.

It needs, however, no argument to persuade the reader that any discussion must be entertaining and instructive, conducted by men as distinguished for their practical success and for their learning as the annals of modern Agriculture teach us those are who "gave in their experience" at the Dinner of Sir Robert Peel.—It was attended by "about 60 of the principal occupying tenants of the neighborhood." Truly is it said that the extent and number of the subjects, too, referred to on this remarkable occasion, and the detail in which most of them were discussed, confer great value on the report of what was said. What subjects more important than the *drainage of land*—its *preparation for wheat and other crops* —the *details of their cultivation*—the most profitable *modes of using farm produce in the feeding of animals,* and the *manufacture of manure?*—points constituting, in fact, the whole practice of ordinary farming—all of which are here referred to in the speeches of the practical men, and explained by the men of science.

To this account of the agricultural reünion at Sir Robert Peel's—himself one of the most wealthy and distinguished noblemen and farmers of the age—we

have pleasure in adding that the *Belgian* Government is giving evidence of its high appreciation of the policy of rewarding improvements in the great Art by which all others live, and move, and have their being. Alas! that we should be driven, for the most gratifying proofs of the auspicious change which these things all indicate, not so much to the chief magistrates and legislators of our own boastful Republic, as to the princes, potentates and noblemen of European monarchies! But, friends of the land, be of good cheer—better times are coming. At this moment (9th Nov.), watching eagerly for every good sign, we are anxious to see what was said at Charlottesville last week, by Hon. ANDREW STEVENSON, for in him, we know, the landed interest will ever find a swift witness in its behalf. The papers speak of his performance with sentiments of the highest gratification, and hopes of its good and lasting effects. "In the fullness of the heart the mouth speaketh,"—so it was with him.

And why, has it been well asked in reference to the measures so creditable to the Belgian Government, should not these honorable marks of distinction be bestowed upon those who have evinced talent and ability of a high order in the practice of that occupation, upon the *economical and skillful conduct of which a cheap and bountiful supply of the necessaries of life depends?* But look at all our Executive Chambers, and Halls of Legislation, and Museums—do you find on their walls the portraits of any of the great benefactors of a Pursuit indissolubly connected, throughout the world, with the welfare if not the very existence of society, and the highest condition of which everywhere indicates the highest state of civilization? Have Societies, or Institutes, or public bodies, in Virginia, or New-York, or Massachusetts, caused the portraits to be exhibited, in their Halls, of John Taylor of Caroline, or Ruffin, or J. M. Garnett, or Judge Buel, or Mitchell, or Wadsworth, or Livingston, or Van Rensselaer, or John Lowell, or Elliot, or Pickering, or Deane, or Wilder, for their services to Agriculture and Horticulture? Alas! honors are most easily won from a perverted public sentiment, by distinction in any other line of art or industry than in that one which, beyond all comparison, is the most useful of all!

The Belgian Minister of the Interior has just addressed the following Circular to the Provincial Governors:

"The Agricultural Exhibition offers an occasion of which the Government is happy to avail itself, of granting special distinction to those cultivators whose eminent merit and useful works render them worthy of being recompensed by the State. I therefore request you, M. Governor, to second these benevolent intentions, and to point out to me those cultivators of your Province whose intelligent activity and honorable conduct appear to you worthy of being marked to the country, and of serving as an example of emulation to their fellow-citizens. I have no need to inform you that your information need not be confined to the great proprietors and the farmers who were able to proceed upon a large scale; you need not fear to go into the lowest ranks, where you will probably find men who are the most to be commended, because with very limited means they effected ameliorations which are profitable to all. I request you to be exceedingly careful in your investigation, and to send me the result by the 20th of this month, adding every detail which may put me in complete knowledge of the case.

(Signed) "The Minister of the Interior, ROGIER."

While we are noting these monarchical honors to the Plow, let us add that an AGRICULTURAL CONGRESS was lately held at Stockholm. It consisted of 420 members, and held twenty sittings, at all of which the *King was present.* On one of the days the members of the Congress all dined together, and the KING and QUEEN and PRINCE ROYAL took part at the banquet.

Since the above was in type, we have met with the following. On reading it we could not help thinking how the Member of Congress would be laughed out

of countenance, if one could be found, to move that a gold medal should be given (not to an officer for killing guerrillas), but to him in each State who should be reported by the State Agricultural Society as the best practical farmer in it! Yet ours is a popular Republican Government, and Agriculture the great employment and support of the country; but 80 per cent. of its expenses, borne by the land, has been, even in time of peace, on account of its military establishments. How long will farmers continue to stultify and impose upon themselves?

AGRICULTURAL ORDER OF MERIT.—The King of Prussia is about to create an Agricultural Order of Merit. The decoration of the new Order will bear on one side of it the effigy of the Royal founder, and on the other the name of the party receiving it, with the legend, "*Pour le mérite agricole.*" The Order is to be divided into three classes, and will be granted to cultivators who distinguish themselves in the exercise of their profession, as well as to all such as, by their inventions or writings on subjects applicable to it, serve the cause of Agriculture. This institution seems to be regarded with much favor on the Continent, since it cannot well fail to contribute much to the development of the agricultural capabilities of a country in which it is adopted.

But let us now join the party at Sir Robert Peel's:

AGRICULTURAL MEETING AT DRAYTON MANOR.

On Thursday, the 23d September, a party assembled at Drayton Manor, which included the following noblemen and gentlemen: The Earl Talbot, Lord Forester, Lord Hatherton, Sir Francis Lawley, Bart., Capt. Dilke of Maxtoke Castle, Mr. Edmund Peel, Sir Henry Delabeche, the Dean of Westminster (Dr. Buckland), Dr. Lindley, Dr. Lyon Playfair, Professor Wheatstone, Mr. Geo. Stephenson, Rev. Mr. Huxtable, Mr. F. Woodward of Comleiston, Mr. Mechi, and Mr. Josiah Parkes.

On the day following (Friday, Sept. 24), Sir Robert Peel invited to dinner about sixty of the principal occupying tenants residing in the neighborhood. Dinner was served about two o'clock in the noble Gallery of Portraits, recently completed at Drayton Manor, the whole party being assembled.

Having given, after dinner, the healths of the Queen and Prince Albert, Sir Robert Peel said he should propose only one other toast, the health of the Earl Talbot, Lord Lieutenant of the county. He should purposely abstain from all panegyrics on the private virtues of Lord Talbot, as he trusted the party assembled was about to occupy their time more usefully than in listening to an interchange of compliments and eulogiums. He was proud to see the party assembled under his roof. It comprised many proprietors of the soil distinguished for their zeal in the cause of agricultural improvement, and a large body of occupying tenants eminent for their skill, and respected for their integrity and high character. It comprised also men who had conferred on him by their presence on that day a great honor—men who *had acquired their patent of nobility by the devotion of their lives to Science, and by making their talents and acquirements conducive to the great end of diffusing knowledge, and of practically improving the condition of their fellow creatures.* There was not one of them who would not freely communicate whatever might be useful or interesting to those whom they met on that day. The cultivation of the soil would naturally be the chief topic of conversation, and he hoped that such men as Mr. Woodward, Mr. Mechi, and Mr. Huxtable (not in formal speeches, but in free and unreserved answers to the questions that might be put to them by the farmers present) would tell them by what means they had made *barren and exhausted soils productive,* and had derived *profit from the application of capital and skill to the improvement of the soil.* Sir Robert Peel then proposed the health of Lord Talbot.

Lord Talbot, in acknowledging the compliment, observed that, although a farmer all his life, he was obliged to admit that he did not know how to grow crops till he this year went into Worcestershire, to visit his friend, Mr. F. Woodward; and, as that gentleman was present, he hoped that he would explain, for the information of the meeting, the principles on which he so conducted his farm as to be able to grow the splendid crops he had witnessed, for he thought that his wheat would this year *average* 50 *bushels per acre.*

Mr. WOODWARD said that although unaccustomed to public speaking, and feeling diffidence in addressing an audience consisting of some of the most intelligent and scientific men that England can boast of, he would endeavor to give the meeting the result of his practical experience of 20 years as an agriculturist. In his opinion, thorough-draining was the foundation of all good husbandry, *without which manures and skill are thrown away.* Some undrained land had come into his occupation—heavy land, which only produced 10½ bushels of wheat per acre; he immediately drained it 3 feet deep, subsoiled it, dressed it with burnt clay, and the *first year obtained from it* 51 *bushels.* He regarded the extensive *burning of clay* land as a most important practice. It rendered the soil so much more friable and convertible, and enabled the farmer to work it with much less horse labor.—The *effects of burnt clay upon all green crops were wonderful*—a most important fact, which could not be too strongly impressed upon the mind, as being very essential to the growth of corn, especially when consumed upon the land by sheep, eating at the same time a little oil-cake or refuse corn. He had not, however, found advantage in the use of Italian rye-grass, which he thought undeserving the praise it had received. The treading of sheep was highly advantageous to the Wheat crop, provided the land was *thoroughly drained and subsoiled.*—In order to secure the requisite amount of pressure, he had not only employed sheep but horses, or even men, who he found could tread down land for 1s. 6d. an acre. He had also found advantage, under some circumstances, in the use

of an instrument which he called a peg-roller. This was formed of an elm-wood cylinder, studded with oak pegs about four inches apart; it proved to be a most effectual implement when drawn over the land—imitating, as it did, the consolidating power exercised by the feet of a flock of sheep. He regarded pressing down the land as opposing an invincible obstacle to the operations of grubs and wire-worms. As to dead fallows, he entirely objected to them as wasteful and useless. On his clay land, when in turn for fallow, he planted vetches, and on his gravel, rye, and rye and vetches. For cleaning his stubbles after harvest, he employed the implement called a two-edged "skim," which he strongly recommended as a cheap and most valuable modern invention. Mr. Woodward then pointed out what he regarded as the best manner of breaking up inferior pastures and converting them into arable; and concluded a very instructive speech by forcibly pointing out the absolute necessity of *sending back to the land whatever is removed by a crop*, and by expressing his entire agreement in opinion with Mr. Woolwich Whitmore, Mr. Huxtable, and others, that farming *properly and efficiently carried out, with capital and skill*, may be made as profitable an investment as railways or other branches of commerce. Being asked whether he held his land on lease, Mr. Woodward replied that he did. But, even if he had not, he, nevertheless, was of opinion that the expense he incurred in the improvement of his land would have answered his purpose, for his improved wheat crop repaid those expenses immediately. Mr. Woodward having expressed a desire that Mr. Mechi would bring under the notice of the meeting the result of his high-farming in Essex,

Mr. MECHI responded to the call. His practice in Agriculture coincided so nearly with Mr. Woodward's, that it was only necessary to say that he grew alternately grain and root or leguminous crops, endeavoring as much as possible to grow wheat alternate years. He had originally drained his land 2 feet 8 inches deep, with pipes and stones, at a considerable expense; but since he had had the good fortune to meet with Mr. Parkes, he had amended his errors, and was draining more deeply and effectually with pipes alone, at one-third the cost. He rented some land adjoining his own; although he held but a seven years' lease, he drained it 5 feet deep with 1-inch pipes, at a cost of from 35s. to 50s. per acre [say $8 to $12]. *He could not afford to deprive himself of the benefit of drainage.* He found it very unprofitable to farm such land undrained. *The very first wheat crop remunerated him for the whole cost.* The result of his improvements at Tiptree had been to double the produce of his farm and of his labor. A portion of it was formerly a swamp, not producing 5s. [$1 25] per acre. He had been entreated this year by a gardener in the neighborhood to let those 4 acres to him, at an annual rental of £5 [$25] per acre. He had removed 3½ miles of unnecessary banks and fences. Taking the arable acreage of the United Kingdom, he thought they might safely dispense with 500,000 miles of unnecessary fencing, which, with its timber, displaced much food and labor. He considered the Agriculture of this country in a very backward and unsatisfactory state, compared with its Manufactures. The agricultural mechanical appliances were rude, costly, and unprofitable. The farm buildings generally were bad and uncentrically placed, causing a national loss of some millions—each ton of produce or manure costing an average carriage of 6d. per mile, renders the position of the building an important national consideration. *Wagons were a most unphilosophical contrivance.* It was quite clear that a long, light, low cart, on two wheels, having an area of capacity equal to a wagon, and only costing half as much, was a much more sensible and profitable mode of conveyance. The question was not now an open one, having been thoroughly discussed and decided upon at the London Farmers' Club; therefore the sooner the *wagons were got rid of the better.* With regard to the quantity of seed, his experiments (conducted now for three years, and publicly recorded) had uniformly been in favor of *thin sowing*—say from 4 to 5 pecks of wheat, and 6 to 7 pecks of barley and oats.—Some of the best farmers in his neighborhood adopted this system successfully. It was highly important, in a national point of view, that this question should be settled; for, if the quantities he had named were available, adieu at once to the necessity for foreign imports. It appeared to be admitted on all hands that, if a bushel of wheat vegetated, it was an ample seeding; and it was reasonable that it should be so, because if each good kernel produced only one ear containing 48 kernels (and that was not a large one), there was no allowance for increase by branching or tillering, which we knew would take place to a considerable extent in well-farmed land, containing an abundance of organic matter. Thin sowing delayed the ripening three or four days; consolidation by pressure prevented the development and action of wire-worm and slug. He had found *salt tended to a similar result.* He salted all his wheat at the rate of 4 to 8 bushels per acre. *and was determined to use much more.* He knew a gentleman in Northamptonshire whose wheat crops could scarcely ever be kept from going down until he used salt, which had effectually kept it standing. He (Mr. M.) salted the manure in his yards.—He found that it sweetened them (he supposed it fixed the ammonia). It was a singular fact that, while salt tended to preserve animal substances, it on the contrary rapidly decomposed vegetable matter. It was a cheap alkali of native production, costing only about 20s. to 30s. per ton, while all other alkalies were nearly eight times as dear. He strongly recommended the abundant use of bones, with and without acid, for root and green crops. It was evident that the bones formed in our growing animals and in our cows, from the produce of the farm, cost us 5d. [10 cents] per lb., or £45 [$225] per ton. Now if we could replace these, as we can do, by bone-dust, at £7 [$35] per ton, it was clearly good policy to use them. He considered the waste of the liquid portions of the manure in most farm-yards a *great national calamity. It was a great mistake ever to allow water to fall on manure.* Water was a very heavy article. A thousand gallons weighed 10,000 lbs., and was expensive to cart. He had heard farmers say, when rain was falling, that they should then litter their yards and make manure!—*Straw and water, in fact.* He found in practice that animals did well on their own excrements and straw under cover—that they consolidated the mass until it was 4 feet thick, when it would cut out like a good dung-heap, and be fit to carry on the land. But if rain-water were allowed to wash this mass, an injurious effect resulted both to the animal and to the manure. *He could not afford* to allow his manure to be well washed in the yards by drainage from the

buildings, and afterward to be washed, dried, and mangled by putting it out in heaps and turning over. It was a waste of time and of money. He found that his crops grew better with unwashed manure. *A farm-yard should be like a railway terminus*, covered in, but amply ventilated. There was comfort and profit in keeping everything dry. It did away with the necessity for water-carts and tanks—the liquid portions of the excrements being just sufficient to moisten the straw and burnt earth, or other absorbent material. He admired and practiced, to a certain extent, Mr. Huxtable's system of placing animals on boards. It would answer in a compact farm with good roads, and in cold climates, to feed sheep in the yards on roots. In mild climates, and dry, friable soils, it was most advantageous to consume the roots and green crops on the land by folding with sheep. There was no expense of carting off and carting back manure. Farmers had found out that the whole of the excrements were thus applied to the land, whereas in open yards with untroughed buildings much was washed out and wasted. He hoped to see the time when tenants would consider it to be their interest (as in parts of Scotland) to pay 10s. per acre more rent for properly farmed, permanent and convenient building, and drainage, in lieu of the miserable and misplaced dilapidations of the present time. It was, no doubt, partly this difference that caused the Scotch rents to appear higher than our own. He was a decided subsoiler to the depth of at least 2 feet. It was a cheap and effective way of getting rid of strong rooted weeds, their crowns being generally just below the ordinary depth of plowing. He did this in dry weather, and with the assistance of a heavy Crosskill roller and scarifier, made his fallows cheaply, quickly, and efficiently. He drilled his wheat at intervals of about 9 inches, so as to hoe them with Garrett's horse-hoe. It cost about 1s. per acre. It was far more expeditious and efficacious than the hand-hoe, and only cost one-fourth the amount. He strongly advocated the abundant use of oil-cake, and also of chalk, on heavy clays deficient in calcareous matter. It had been proved that much more produce had resulted from oil-cake folding than where an equivalent amount was expended in corn. Good high farming was by far the most profitable—the starvation principle was a losing game. If we borrowed from the earth we must repay, or we should soon find an empty exchequer.

Rev. A. HUXTABLE then rose and spoke to the following effect: I think this by far the most interesting agricultural meeting that I have ever attended, on account of the variety of important views and practices which have been brought under our notice. For my own part, at so late a period of the day, I must content myself with adducing a few facts that have come within my own farming experience, and defending one or two points of my farming practice which have been glanced at by the preceding speakers. As I see so many landed proprietors around me, I must beg permission to impress on them the duty of allowing their tenants to break up, under proper restrictions, the poorer lands now lying in grass. I think that I can show from my own experience that national wealth, the profits of the tenant, and the interests of the laborer, are deeply concerned in converting poor pasture into tillage. Thus, in my own parish, five years ago, there being many laborers out of employ, I obtained the consent of my landlord, Mr. Sturt, to break up the whole of the grass-lands of a small dairy farm. It consisted of 95 acres, 10 of which only were then under the plow. When I entered on the occupation, the farm supported 14 dairy cows, and grew 48 bushels of wheat and 40 bushels of beans. Now it annually produces 1600 bushels of wheat, 40 head of cattle, cows, yearlings, and calves, and 100 sheep are fatted, and 80 pigs, and where 3½ laborers were employed, 12 are now sustained all the year round. But the farm, gentlemen, labors under one embarrassment,—such a one as I wish you all felt—such an accumulation of manure that, with the fear of laid wheat crops before my eyes, I know not where to place it. Allow me to detail briefly the steps by which this surely happy result has been brought about. I began at the beginning. I first drained the land; but of draining you have heard to-day so much that I will only say that, though it has been most successful, I yet heartily wish that I had earlier known Mr. Parkes's drainage. My fields would have been far more economically and effectually rid of their bottom water. I tried when this was done to improve the herbage of some of the better pastures, but neither liming, nor sheep-folding, nor guano, enabling me cut more than 15 cwt. of hay per acre; I pared and burnt it all, and cut down, by my kind landlord's leave, all the hedge-row timber, and grubbed up all save the boundary hedge, and have now a glorious farm. The next object was to provide for the permanent fertility of the soil by keeping a large amount of stock; for I hold that a farm ought to be made self-supporting as far as possible, and the purchase of manures should be regarded as only a temporary expedient, a necessary evil.—My first effort to consume the green crops grown on half my farm was very expensive, and therefore unsuccessful; for with regard to the beasts, I was forced to purchase a ruinous amount of straw, and the sheep eating off the Swedes on clay land in winter puddled the fields, and were themselves, amid good food, objects most pitiable. But when our principles are good, we must not allow slight difficulties to stop their application. I therefore determined to place my milch and store cattle on boards, as wood is an excellen non-conductor; and after a series of devices, I have succeeded in making them tolerably comfortable, so that I am now no longer dependent on my straw for the quantity of cattle which I keep. I am only limited in the number of animals which I keep by the amount of green food grown. In like manner, but with a variation of arrangement, the sheep were placed on small boards about 3½ inches wide, with an interval of about ⅞ inch between each, to permit the manure to fall freely into properly prepared tanks below. This is by far the most successful provision which I have made. Of 1,000 sheep so placed, I have never had one lame. The pigs in like manner, when fattened, sleep on a boarded stage above their feeding-place, and except in very cold weather require no straw for litter. Thus I have dispensed with a large expenditure of straw, which my cereals (half the farm) could not sufficiently provide. But I hear some one exclaim, "What do you make of your straw?" First of all, a good deal is required for bedding the horses, and the young stock which are in loose-boxes; and as they never tread the green fields, they require a great quantity of white bedding. Secondly, a great deal is wanted for food, being mixed with the green leaves of the root crop and the mashed turnips. Thirdly, a ton per acre is used in making clover and vetches into imperfectly dried hay, with a due admix-

ture of salt to arrest fermentation. These uses fully take up all the straw which I grow. I think the methods employed in preparing the manure from the "boarded" cattle deserve mention. First the liquid manure flows into large tanks; *below* them is another, which I call the mixing tank, for in it the manure is diluted with water to any degree which the state of the weather may require, the rule being that, in proportion to the increase of temperature must be the increase of dilution; *i. e.* the hotter the weather the weaker should be the manure applied. In order to avoid the expensive and often injurious water-cart, I have laid down over the highest part of my farm a main of green elm pipe, of 2 inches diameter, bored in the solid wood; at every 100 yards distance is an upright post, bored in the same manner, with a nozzle. A forcing-pump fixed at the mixing tank discharges along these pipes, buried 2 feet in the ground, the fluid with a pressure of 40 feet; of course it rushes up these pierced columns, and will discharge itself with great velocity through the nozzle; to this I attach first of all 40 yards of hose, and therewith water all the grass which it can reach. To the end of this hose another 40 yards of hose are attached, and a still larger portion of the surface is irrigated, and so on for as many 40 yards as are required. When enough has been irrigated at the first upright, the nozzle is plugged, and the fluid is discharged at the next 100 yards distanced column, and so on. For this application of the hose I am entirely indebted to that most able man, Mr. Edwin Chadwick: the green elm pipe is my own contrivance. The cost of the prepared canvas hose, which was obtained from Mr. Holland, of Manchester, was 1s. a yard —the wooden pipes cost me only 1s., and being under-ground they will be most enduring. By an outlay of £30 I can thus irrigate 40 acres of land; and see how inexpensive, compared with the use of the water-cart and horse, the application. A lad of 15 works the forcing-pump; the attaching the hose and its management require a man and a boy. With these, then, equivalent to two men, I can easily water two acres a day, at the rate of 40 hogsheads per acre of the best manure in the world: I say *best*, because all chemists will assure you that the liquid contains the principal nitrogenous and soluble salts, and therefore is far more valuable than the dung, and it is plain enough to every man, though he be no chemist, that plants can only take up the manure in a liquid form. The principal use which I make of the hose is to water the clover, and, above all, the noble, but this day much-decried, Italian rye-grass. How hard Mr. Woodward was upon its soft sweet herbage! Yet his own excellent principle, that you must carry back to the land an equivalent for what is taken away, may be successfully alleged in defence of this most productive and nutritious of all grasses. It is certainly true that if you cut and carry away Italian rye-grass, and do not also carry back the manure made in eating it, you will not be able to grow wheat after it. But from my own observation I know that if after each cutting the hose immediately follows, you may cut it without wrong to the land as often as you like, and an amount of fodder will be obtained which no other plant can approach. It comes the earliest, and grows the longest of all the grasses; and I feel confident that, with such appliances as I have mentioned, you may secure fifty tons per annum of this milk-giving, fat-producing, muscle-making grass. I can refer to Mr. Dickinson, of Curzon-street, as an authority for growing at least this weight of green food, and I believe far more. That you can cut it, by the help of liquid manure, six times a year, admits of no doubt. With regard to the manure made by sheep, as previously described, you will readily perceive its value if you reflect that when you give a flock in their house 20 tons of Swedes and their tops, you have minus only the increase of their bone and wool made during the three months of their happy confinement, all the inorganic and most of the organic ingredients of the crop being under the boards; in fact you may say that on the boards you have a fatted flock, and below the boards yet 20 tons of Swedes and their tops. I think that a good deal of misapprehension prevails respecting this mode of shed-feeding sheep, for you hear frequent comparison made on the superior system of feeding off crops in the fields. I have no doubt that in the summer months even fattening sheep will "do well" out of doors, and at the same time fertilize and consolidate the land; but I speak of feeding off winter crops by sheep which you wish to fat: and here I cannot think that the two systems admit of comparison, so superior are the results of the house and board system. But the conditions under which an animal is to be reared are quite different from those which you would observe in laying on fat. In the one case, exercise is absolutely necessary; in the other case, the quieter and more still the creature is kept the better. Briefly, then, my own practice, which science surely justifies, is this: the greater proportion, about two-thirds of my best roots are carted to the sheds, and given to the animals preparing for the butcher; whereas the tops and the smaller turnips are fed off by my breeding flock on the land, assisted by oil-cake and corn when necessary, and thus the land is rendered firm, and the ewes are kept in healthful exercise. Lastly, I must advert to the treatment of the dung made by the cattle and pigs. That on the boards is hourly swept down, and wheeled away to a long covered shed; contiguous to this is another shed containing a large store of burnt earth and other ashes. The dung is worked up with the ashes, and therewith are mixed the other manures, dissolved bones, soot, powdered chalk, &c. This, about 8 or 10 cart-loads per acre, is carted to the field ready for turnip sowing. The manure is drilled in by one of those that deliver moist manure, and thus 8 acres can be got over in a day drilled on the flat. If the field is very poor the drill goes over 4 acres in the morning without seed; in the afternoon the same quantity is again deposited in the same ruts, and the seed upon this double discharge. The advantage of this is, that the dung is never exposed to the drying of the sun or air; that the seed being deposited over a moist bed, germinates immediately in the driest season, and cares not for the fly, though for the prevalent grub it is certainly no remedy. The pig manure I consider the best of all; because one-half of the corn I feed them on is in the shape of beans, which contains the best mineral ingredient for growing Swedes, as I have endeavored to set forth in my "Lecture on Manures." These, gentlemen, then, are the principal points of the practice which have brought me into that pleasing embarrassment of which I spoke before, and which I wish may befall you all—more manure than you can safely put on your arable land.

Dr. PLAYFAIR remarked that so much had already been said about produce that he wished more particularly to draw attention to the fact that a great variation existed in the nature and

qualities of that produce when obtained. There were two purposes to be accomplished by all food, one of them being the increase and repair of the bodies of our animals—the other the support of animal heat. The body was an engine destined to perform particular work, and required various materials to keep it in constant action. Coal, which did admirably to generate steam, would be a most inadequate substance to repair the pistons and cranks of the steam-engine when it became damaged by use. So was it in the animal body, for that which built up its fabric was not suited to sustain its warmth, without which the exercise of its functions must cease. Food contained these substances in different proportions, some varieties of produce being well suited for fuel, while others were for true nutrition. Thus the potato formed a cheap and excellent fuel for the body, but was most expensive and inefficient as a means of repairing its damaged parts, while beans answered well the latter purpose, and were comparatively valueless for the former. The manner of manuring crops depended upon which of the two classes they belonged to; the flesh-forming principles were always associated with phosphorus and sulphur, which must be supplied with bone-earth, and sulphates, while the warmth-giving foods principally depend for their growth on a free supply of alkalies. Besides this, as farmers are the cultivators of food for the nation, it was important for them to know, especially in times of scarcity, such as we have had, with what crops they could grow the largest amount of food on the same space. In this respect the produce is most variable. Thus, while turnips, mangel-wurzel, &c., will grow nearly 700 lbs. of flesh-forming principles per acre, beans 600, and Italian rye-grass considerably more, you cannot obtain, in ordinary crops, more than 350 lbs. of potatoes and peas and barley, not more than 200 lbs. from a fair crop of wheat or hay, or 150 lbs. from an average crop of oats. The variation of produce is, therefore, very considerable. But as profit is naturally and most properly the great object of the farmer, it was equally important to know at what remunerative cost the public became supplied with the equivalent amount of various kinds of food. At London prices, a man can lay a pound of flesh on his body, with milk at 3s.; with turnips at 2s. 6d.; with potatoes, carrots, and butcher's meat, free from bone and fat, at 2s.; with oatmeal at 1s. 10d.; with bread, flour, and barley-meal at 1s. 2d.; and with beans and peas at less than 6d. These considerations are far from trivial, because when we consider that an equal amount of nutritious matter can be obtained from one food at less than one-fourth the cost of another, this is only saying that in times of distress, with an intelligent application of money, we can feed four people where formerly we could only feed one. True it is that in this country the art of cookery is far behind that of our Continental neighbors, and that we have not acquired the important art of rendering cheap varieties of food palatable. Count Rumford, when administering the affairs of Bavaria, and in introducing his important ameliorations into the habits of the poor, used to say that the internal resources of a country for food were as much dependent upon its cooks as upon its farmers, and in this he was perhaps not very far wrong. He meant by so saying to imply that a skillful adjustment of food and its skillful treatment might so render the cheapest food palatable that you could adequately sustain a larger population upon a limited area by attention to the produce cultivated. It is only lately that philosophers have attended to the art of cookery, and most important results have already been obtained. It is now known that the flavoring principles are dissolved in the juices, so much so, indeed, that if you macerate the flesh of a fox in the expressed juice of venison, and afterward cook it, the former cannot be distinguished in flavor from the latter, or the flesh of a fowl may be made to taste like that of a pike by such maceration. In our ordinary way of cooking, however, a large portion of the flavoring substance is dissolved in the water, and is thrown away, unless it be, as is most proper, converted into soups. But far greater results follow from our ignorance of cooking. There is a substance called phosphate of soda contained in food, and it is by this salt that respiration is supported; without it we should die by asphyxia, as no means exist except this for carrying off carbonic acid from the system. This salt being soluble is very generally carried off from food during cooking, and the most distressing physiological results follow from the neglect. In salting meat, such phosphates are abundantly carried off with the brine, and scurvy naturally follows from the consequent want of adjustment between the organic and mineral portions of the food. Liebig, and others, have opened the way to study these important considerations in cookery, and he (Dr. Playfair) hoped to have an opportunity at some future time of explaining this subject more in detail to farmers. He now directed their attention to it, with the especial object of improving their cottage cookery, and the comfort of the workmen under their charge. If we could improve the cottage cookery of this country, if we could render palatable a greater variety of viands, the most important ends would be obtained. Wants would be created, and labor given for their gratification. A greater variety of produce would be cultivated in this country, labor would be better distributed and equalized, and the country would be freed from those dreaded visitations of famine which now unhappily arise from the failure of one of our few kinds of food.

Mr. PARKES said that he could mention a fact or two connected with the use of salt, which might be interesting to the farmers present, and, although not a farmer himself, he had, perhaps, more opportunities, from his extensive operations in drainage, of observing and learning the practice of farmers than the generality of agriculturists. It had been the habit for many years of those well-known and excellent farmers, the Messrs. Outhwaite, of Bainessee, near Catterick, in Yorkshire, to apply a very large quantity of salt as a dressing to the soil in preparing for wheat, *he believed more than a ton per acre*, but he did not recollect the exact weight or measure. They found it expedient on their soil to work the land well during the autumn and winter, and sow spring wheat. They were of opinion that the salt tended directly to the destruction of grubs, &c., and indirectly to the improvement of the plant itself. The land was well drained. The account of Messrs. Outhwaite's mode of farming was to be found in the Reports of the Yorkshire Agricultural Society, which body had not unfrequently conferred on these gentlemen their prize for the best farmed land within their district. An instance of the presence of enormous quantities of salt in land not accompanied by infertility might perhaps tend to disabuse the farmer's mind of a prevailing

idea that salt was applied even moderately and with judgment. He had observed in the autumn of 1845 a wheat crop on some land warped from the Humber at Patrington, in Yorkshire, the soil of which was quite white on the surface with crystalized salt, the result of powerful evaporation. The crop might average perhaps from 20 to 24 bushels per acre. This was the first crop of wheat taken off the reclaimed land after rape allowed to seed, which is used in these salt crop districts as the precursor of wheat, and is considered to take more salt out of the soil, and to fit it more quickly for wheat than any other plant. These crops of rape are frequently prodigious; salt, therefore, in such excess as actually to lie crystalized on the surface, is not injurious to rape, and may possiby be very advantageously applied as a hand tillage for rape in soils which do not contain it. On first draining these warp lands from 4 to 5 feet deep, the water, after rain, issues so strong of salt as nearly to float an egg, and for years afterward the water of drainage tastes brackish. That crops of all kinds—of wheat particularly—are vastly increased by draining, he had occasion to know from the effects produced on Mr. W. Marshall's estate at Enholmes, Patrington; but on the undrained lands, and therefore on soils not deprived of their salt by drainage, 5 quarters of wheat per acre, without the application of any manure, were a very common produce on this remarkable soil. The common earth-worm established itself in great numbers after drainage, but he had never observed any grubs or wire-worms in those soils.

Sir R. Peel having proposed the health of the Dean of Westminster—

Dr. Buckland, in returning thanks, addressed the company to the following effect: At this late hour I will trespass upon your time—which has been so long and so profitably occupied in hearing the results of the application of scientific principles to practical Agriculture—no farther than to express my conviction of the soundness of the principles which have been set forth by the three practical agriculturists who have laid before us the results of their scientific management of lands which, under ordinary treatment, were sterile, but in their hands have been rapidly rendered prolific in an unusual degree. It would be waste of time to enter into proofs of what is now universally acknowledged, and has been exemplified by the great improvements immediately resulting from drainage in the farms cultivated by Mr. Woodward, Mr. Mechi and Mr. Huxtable, viz., that drainage is the foundation and first condition indispensable to the profitable cultivation of all lands that are naturally wet; for on such lands, without drainage, all applications of manure or attempts at improvement of any kind are vain. But the land once drained is in fit condition to become the subject of any and all the profitable experiments we have with so much pleasure and profit heard described by the individuals who have made them. The best test of the truth of theories founded on the inductions of Science, is an appeal to practical results, such as have been detailed to us; it has been my good fortune to inspect on two occasions the farm and farm-yard management of Mr. Huxtable, and thereby to be able to bear testimony to the reality of the results he has enumerated in no exaggerated terms. The great point he has established in practice, and which all the experiments of scientific men have indicated to be the basis of practical Agriculture, is this, that *as it is the object of the cultivator to obtain from the earth those vegetable and animal productions which contain the elements of the food of Man, so it is the object of the scientific farmer to apply to the earth, in the form of manure, the elements of the food of plants, in such kind and in such proportions as chemical analysis shows each kind of plant and each kind of grain respectively to require*; and I believe that no living man has carried the combination of science with practice, as to these points, farther, or with more perfect success, than Mr. Huxtable. Dr. Lyon Playfair has stated valuable results of chemical analysis, indicating the proportions of various kinds of nourishment in the seeds of plants we use for food; and has told us that scientific cookery has become the most recent addition to the subjects of the laboratory; and that while the farmer ought rather to study to supply flesh to the cook, than tallow to the chandler, the cook must also learn from the chemist the most efficient and most economical prescriptions for the preparation of that best result of agricultural experiments, viz., nutritious and wholesome and savory food for Man.

The health of Sir Robert Peel having been proposed by Lord Talbot, drank with enthusiasm, and acknowledged in a brief but admirable speech, expressive of the strong interest taken by the Right Hon. Baronet in advancing the Agriculture of his country and promoting the welfare of the Farmer, notwithstanding what had been said to the contrary, the meeting separated, leaving a conviction on the minds of those who were present that it was one of the most interesting and important that has ever been held in England.

Incombustible Wash.—Slake some stone-lime in a large tub or barrel, with boiling water, cover the same up to keep in all the steam. When thus slaked, pass six quarts of it through a fine sieve. It will be then in a state of fine flour. Now to six quarts of this lime add a quart of salt and one gallon of water; then boil the mixture, and skim it clean. To every five gallons of this mixture add one pound of alum, half a pound of copperas, by slow degrees, three-quarters of a pound of potash, and four quarts of fine sand or hard-wood ashes, sifted. This mixture will admit of any coloring matter you please, and may be applied with a brush. It looks better than paint, and is as durable as slate. It will stop small leaks in the roof, prevent the moss from growing over and rotting the wood, and render it incombustible from sparks falling upon it. When laid upon brick-work, it renders the bricks impervious to rain or wet.

Malaga Raisins.—These are all made by merely drying the large white Muscadel grape without the addition of any ingredient. They are all raised within two leagues of the Southern Spanish coast, and do not succeed farther inland. The Lexica raisins, used for puddings, are, however, produced in the interior. They are gathered when ripe, and spread out upon the ground to dry, which usually requires 15 days, during which time they are never removed, although the drying process is retarded by the dews, which difficulty would doubtless be removed by the use of portable awnings.

GRAPES AND WINE.

THE CULTURE OF GRAPES AND MANUFACTURE OF DOMESTIC WINE IN OHIO.

BY H. LONGWORTH, CINCINNATI.

[From Communications made to the American Institute, in relation to Agriculture and its Products.]

I HAVE selected for the cultivation of the grape for wine, hills on the Ohio River, or within a few miles of the river, planting the vines on the tops and the sides of the hills, without particular regard to the exposure. The tops and sides of our steepest hills are rich, and little or no stone near the surface. The north sides of our hills are the richest, and as our seasons are long and warm, I consider the north sides equally favorable to the cultivation of the grape as the other points of the compass. Where the sides of the hills are so steep as to occasion washing of the soil, I trench the ground from 18 inches to 2 feet deep, and lay it off in benches, usually sodding the benches, but where, in trenching, stones are thrown up I give them the preference. The cost of benching is about $50 per acre, done in the best manner. The depth to which I trench depends on the depth of the soil. The substratum is usually clay, and I trench deep enough to bring from 4 to 6 inches of the poor soil on the surface, wishing to keep the roots that far below the surface. When I first commenced my vineyards, to meet the views of my tenants, who must do it as they were accustomed to do it in Germany, the ground was trenched 3 feet deep, even where the good soil was less than a foot in depth, and the stiff clay thrown on the top. The consequence was the vines did not flourish, for the roots are generally inclined to keep near the surface, and never reached to the good soil, 2 feet below the surface. Where the ground is not so steep as to wash, deep plowing is all I deem necessary.

On the benches on the side hills, I usually place the rows from 4 to 4½ feet apart. I leave a distance of 3½ or 4 feet between the plants, and tie them to the stakes, generally of locust, from 5 to 6 feet high. On the benches we never use the plow. On level ground I should plant the rows 5 or 6 feet apart, and leave 4½ feet between the plants. Our soil in general requires little or no manure. We use occasionally all kinds of manure, but always have it well rotted before we apply it.

In planting cuttings, I plant two in each hill, placing them within 2 or 3 inches of each other at the top, and widely separated at the bottom, to enable me to remove one of them without disturbing the roots of the other, should both grow. If the growth has not been sufficient to produce well-ripened wood, I cover it with earth the first winter. Early in the spring I head down the plant to two or three eyes, as soon as I discover which is the strongest shoot, break the others off, and permit one only to grow. I break off three or four of the first lateral branches, and after that give the plants no attention till the spring following, when I again head them down to four eyes, and permit two of the strongest to grow, taking off the lateral branches to such point as I expect to prune to the next spring. The spring following, (the third year,) I expect a small crop of fruit, and prune the strongest branch from 2 to 4 feet long, according to the growth of the plant, for bearing, and prune the other shoot, leaving five eyes, three of the strongest of which I allow to grow, breaking off lateral shoots as usual, and the following spring cut out the bearing wood of the preceding season, always pursuing the cane pruning, and leaving none of the two-year-old wood; and thereby always have all my shoots within a foot or 18 inches of the ground. In breaking off the lateral shoots, it must not be done till the wood begins to ripen; for if done too soon, it forces out the fruit buds of the next season, which brings a crop that is usually killed by the frost of the next fall, before fully ripe. I have frequently had the tops of my vines broken off by a heavy wind, and numerous fruit buds of the next season forced out; and when the fall was favorable, which is often the case on the Ohio, had a fine show of grapes fully ripe the last of October.

As a matter of curiosity, I have on the same vine had fruit not only of the current year, but from the buds of four succeeding years. Say in May, 1847, as soon as the plant is in blossom, I cut off the extremity of the shoot, and force out the fruit bud, designed for fruit in 1848. As soon as the fruit bud of 1848 is in blossom, I again cut off its extremity and force out the bud designed for fruit in 1849, and so continue to clip the extremities, till the growing season is over. In a grape-house properly heated, the fruit of the different years may all be brought to maturity. My Germans are averse to pruning till spring, as such was the practice in Germany. This often interferes with spring work. I would recommend pruning in the

fall, as soon as the leaves have fallen, and at the same time plant out cuttings. Where planted in the fall, I should plant so as to leave the upper bud even with the surface, and throw a little soil over it, and remove in the spring, as soon as the severe frost is over.

We gather our grapes as soon as they are fully ripe. In many parts of Europe they are suffered to hang on the vines till past maturity. This adds to the saccharine principle, but I find it injurious to the aroma and flavor of the wine. I cultivate none but red or black grapes. If red wine be the object, we mash the grapes, and have a partial fermentation before pressing, to bring out the coloring matter, which is contained in the skin. If a light colored wine be the object, we mash the grapes, and press them out as soon as gathered. We carefully pick from the bunches all rotten and green fruit. As soon as the must is in the cask I move it to the wine-room, which is sometimes in the cellar, and at other times above ground. In neither case has it ever run into the acetous fermentation.

We formerly added sugar to all our must before fermentation—to the Schuylkill Muscadel, from 12 to 16 oz.; to the Catawba, from 6 to 10 oz. to the gallon—being governed by the quantity of saccharine matter in the must, and also the quantity of leaven. Of late years, if the grapes are ripe, we use no sugar to the Catawba grape, and never add spirit in making wine from other grapes. Of the character of Madeira or Port, we generally use sugar before fermentation, and add from five to eight per cent. of brandy after the fermentation is over, to make it resemble those wines to which brandy is always added. The Isabella makes a very indifferent wine, unless 24 to 32 oz. of sugar is added to the gallon of must, according to the maturity of the fruit, when it makes a superior sweet wine, equal to the best imported.

The Reports of some of our Horticultural Societies, and publications of some of our vine-dressers, speak of 500 gallons of wine to the acre as an average yield. There is more of poetry than truth in these statements. After 30 years of cultivation, I deem 200 gallons to the acre a full average crop. The most I have known grown on two acres was 1,300 gallons from the Catawba grape. This I consider our most valuable grape for wine, and manufactured with care and left till of proper age, will rival the best dry Hock. After two years' trial, I am satisfied it will also make a superior sparkling Champagne, and am now erecting a vault and building to have it manufactured extensively. From the Isabella grape I one year made from 1-14 of an acre 105 gallons, being at the rate of 1,470 gallons to the acre. This grape ripens unequally with us, and is very subject to the rot. The Missouri bids fair to be valuable as a wine grape; and the Herbemont would be very valuable both for the table and wine if it were less subject to rot. I have tried the foreign grapes extensively for wine at great expense for many years, and have abandoned them as unfit for our climate. In the acclimation of plants I do not believe. The white Sweetwater grape is not more hardy with me than it was thirty years since, and does not bear as well. I have tried them in all soils, and with all exposures.

I obtained 5,000 plants from Madeira, 10,000 from France; and one-half of them, consisting of twenty varieties of the most celebrated wine grapes from the mountains of Jura, in the extreme northern part of France, where the vine region ends; I also obtained them from the vicinity of Paris, Bordeaux, and from Germany. I went to the expense of trenching 100 feet square on a side hill, placing a layer of stone and gravel at the bottom, with a drain to carry off the water, and put in a compost of rich soil and sand three feet deep, and planted on it a great variety of foreign wine grapes. All failed; and not a single plant is left in my vineyards. I would advise the cultivation of native grapes alone, and the raising of new varieties from their seed. It may be advisable to cross the Catawba with some of the best foreign wine grapes, and raise from the seed.

I have 24 vineyards, and about 67 acres of vineyard in bearing, and about 32 acres recently planted, or ready for planting in the spring. Last year there was a partial failure of the crop, but we made 300 barrels of wine, being 200 barrels less than we calculated on making before the rot commenced in the grapes. Of the cost and profit of cultivation, I am not fully competent to speak; for profit has not been my object, nor have I devoted that attention to my tenants that a regard for profit would require. I commenced with the firm belief that the climate and soil in this region were admirably calculated for the cultivation of the grape and manufacture of wine, and though I had little hope of succeeding in the cultivation of foreign wine grapes, I determined to give them a fair trial, and resolved to collect native grapes from different parts of America, believing, as the Hughes crab-apple of Virginia gave us better cider than any foreign apple, I might find a native grape capable of making a superior wine.

About twenty-five years since, I commenced settling Germans on my hilly ground, and setting off to each from 12 to 25 acres. They were generally very poor. There were no written contracts, but the understanding was, I was to furnish all grape-cuttings and fruit-trees wanted; I paid for trenching and benching portions of the ground, and gave them such aid as was necessary at the outset. I was to have half the wine at the press, and half the amount of sales of the other fruit. All other articles raised on the place were for their own benefit. The grapes were generally neglected, as it took some years to bring them into bearing, while the potatoes and sour-crout yielded an immediate income. My first tenant, instead of having a crop of grapes the third or fourth year, had

his crop the ninth year, when his share yielded him $200. The tenth year his wine yielded him about $300. So large a sum, and all in silver, bewildered the old man's imagination. He made me his best bow, went into the interior, bought land, and began a vineyard on his own account. His latitude was too far north for the grape, and after six years' absence the old man returned nearly penniless, and began a new vineyard on 4 acres of ground, adjoining the old one, then and now under charge of one of his sons-in-law. He will next season make some wine; but to cheer the old man's spirits, we have enabled him occasionally to take his accustomed glass of wine, and sing his old song under the shade of his favorite tree.

Most of my tenants have occupied their present vineyards from 10 to 25 years, and are contented and happy, if not rich. One of them who works harder than any of the others, and keeps his family at work, and devotes most of his time to his vineyard, made from his wine last year $1,400. But I would not recommend the cultivation of the grape for profit to persons who hire all and work none.

Our wines have always met a ready sale in the city, and bring from $1 to $1 50 per gallon. The grape culture is now spreading rapidly, and we must look out for a market abroad. The price will depend on the manufacturer. In the wine countries of Europe it is a standing proverb that "a poor man cannot make good wine." The reason is obvious: he is compelled to sell his wine when new, and cannot devote the necessary attention, and wait till his wine is five or six years of age, before he sells it.

It is there also said that all depends on soil and exposure; and while the wine at one vineyard brings $12 per dozen, the wine of an adjoining vineyard will not command one-quarter the sum. In this doctrine I place no reliance. With us, I find the quality chiefly depends on the care and attention of the manufacture. Wine requires much greater skill and care in the manufacture than is requisite in making cheese and butter. What more simple than the making of butter, yet one tenant on a farm will make butter of a superior quality, while the butter made by another tenant on the same farm, with equal facilities, is scarcely fit for use, and will not command half the price of his brother tenant. In Europe a landlord often commences with selling his wine at $3 per dozen, and ends by selling it at $12 or more, as his reputation becomes established. A manufacturer who values the reputation of his vineyard, in unfavorable seasons sells his wine in the cask, without attaching his name to it, at a low price.

The cultivation of the grape for wine in our country was attempted about fifty years since by a company at Spring Hill, near Philadelphia. They tried foreign wine grapes and found them unsuited to our climate. They found one grape only to stand the climate and bear well.

(837)

The idea of manufacturing wine from a native grape would in that day have been hooted at, and the manager wisely, if not honestly, called it the Cape grape, though taken from the banks of the Schuylkill—leaving it to be inferred that the wine was from the Cape of Good Hope. The next attempt was by the Swiss emigrants at Vevay, Indiana. They found the grape of Switzerland unsuited to our climate; and hearing of the Cape grape succeeding at Spring Hill procured it, and for many years cultivated it, making a hard, rough, red wine, excellent for sangaree, but not relished as a table wine.

Their vineyards have gone down, and the Cape grape (Schuylkill Muscadel) is now but little cultivated. It is one of our surest bearers, and pressed as soon as gathered, and manufactured after the manner of Madeira and Teneriffe wines, when at a proper age it greatly resembles them.

We are indebted to Major Adlam, of the District of Columbia, for the introduction of the Catawba, our best wine grape. He erred in making from it a sweet wine. The Major was compelled to cultivate it with a view to immediate profit, and injured the reputation of his wine, in seasons when the Catawba did not produce a full crop, by mixing with them the wild grapes of the woods in his vicinity. By the introduction of that grape he was a great benefactor to the nation, and the day is not distant when the banks of the Ohio will rival the banks of the Rhine, in the quality and quantity of the wine produced. Our German emigrants are the people who will accomplish it. Our hills suitable for wine are of little value for other cultivation. Give a German ten acres of this land, and if he has a wife and children he will live in great luxury. He will never want for his two greatest of all luxuries, wine and sour-crout. His children, however small, not only aid him in the cultivation, but his wife, during the summer and fall, does the greater part of the labor in the vineyard. The poor vine-dressers in Germany are seldom so rich as to own a horse, and therefore over-estimate their value. Yet greatly as they value the acquisition of a broken-down pony in this country, it does not lessen their estimation of the great value of their wives in the vineyards. A very honest Dutch tenant of mine, who was so unfortunate as to lose his wife, observed to me, "He might just as well have lost his horse."

BEST TIME FOR KILLING ANIMALS.—It has lately been discovered that the flesh of animals which are killed in the middle of the night will keep much longer than it will when they are killed in the day time; and it is for this reason preferred by those who prepare potted meats. This circumstance is very singular, for it proves that the flesh is fittest for keeping when taken from the animal at the time when the respiration is slowest and the temperature of the animal lowest. It is well known that the flesh of animals which have been hard driven will not keep at all. After what has been stated we need not be surprised, as this quickens the respiration and hightens the temperature. [Dumas's Chemie.

SALE OF CROPS ON THE GROUND IN SCOTLAND.

AMERICANS often wonder at the quantity and cost of manure and of labor applied to land in England and Scotland, and are at a loss to know how it is that lands should *rent* there for more than would buy the *fee simple* of what we call middling land in the United States.

The following authentic accounts of sales of standing or growing crops there, as reported in a late number of the "Mark-Lane Express," will go far to unravel the mystery and dispel doubt for those who have not inquired or reflected on the subject. The probability is that these Wheat crops averaged from 30 to 50 bushels to the acre, Oats 60 or 70, and Potatoes not less than 400.

Who can tell what may be done in our country when recourse has been had, in like manner, to the accumulation of great quantities of manure, to thorough-draining, and to perfect tillage—all according to the true *principles of Agriculture*, as ascertained by scientific investigation and practice, and as detailed from month to month in this "FARMERS' LIBRARY." [Let the reader allow $5 for every £1 sterling.]

SALE OF GROWING CROPS AT PERTH.—On Thursday se'nnight there were sold, by public roup, at the Home Farm of Cadder, about seventy acres, imperial measure, of growing crop. The wheat was almost ready for the sickle, and some of the oats were partly cut down. We saw several very large potatoes, which were pulled up by some of the farmers present, who pronounced them free from disease. The turnips also were forward, and looked healthy. The following are the average prices of the sale: Potatoes, from £28 5s. to £37 10s. per imperial acre; S. turnips, from £10 10s. to £11 15s. ditto; Y. turnips, from £9 5s. to £11 ditto; oats, from £9 10s. to £10 12s. ditto; wheat, from £10 10s. to £11 14s. ditto. [Witness.

SALE OF CROPS AT AYR.—The sales of crop this year in our neighborhood have been well attended, and brought excellent prices. At Macnairston, wheat averaged £11 per Scotch acre, turnips £16; and at Friarland, beans from £10 to £12 15s. At Thornbrock, parish of Maybole, middling oats brought from £6 to £9; at Broadshean, £5 to £7; at West Enoch, £6 to £8; and, at Mackailston, potatoes brought upward of £40. Hay, in general, has also sold well, especially meadow, which is sought after for winter fodder. The above quotations are from a few of the last of the numerous sales conducted by Mr. Mitchell, auctioneer, Maybole, this year.
[Ayr Advertiser.

SALE OF CROPS AT DUMFRIES.—Last week we stated that oats had been sold at Comlongan Mains at £13 10s. per imperial acre.—We have been made aware of higher figures since, although only in two instances. At Mr. Williamson's sale, Main of Friars Carse, early Angus-shire oats sold at £13 17s., and potatoes at £12, making an average of twelve guineas [$60] over 17 acres. On Stapleton, on the 16th, Messrs. Farish and Brand, as agents, sold 114 acres of standing corn. The domain was necessarily divided into a number of lots, the highest of which actually realized £14 5s. [$61] the imperial, or pretty nearly £13 the Scotch, acre. Having examined a small sample of the grain, we consider it among, if not, the very finest that ever was shown in any market, [Dumfries Cour.

THE FRUIT CROP ON THE RHINE.—"In the memory of man," says a letter dated Wiesbaden, the 23d ult., "the crops were never so abundant as this year in our country. All the trees are overloaded with fruit, and we cannot procure a sufficient quantity of stakes to support the branches. The Government has ordered the Administration of the Forests to provide a supply for the farmers and horticulturists, and no less than 80,000 have been already demanded. Apples are particularly abundant. The English have purchased an enormous quantity of that fruit, which is to be embarked in steamers for London."

RENOVATION OF MANUSCRIPTS.—Take a hair pencil and wash the part which has been effaced with a solution of prussiate of potash in water, and the writing will again appear, if the paper has not been destroyed.

DRAINING.

THE PRINCIPLE OF ITS UTILITY EXPLAINED.

HAVE we dwelt or can we dwell too often on a point connected with agricultural improvement which, until lately, has not attracted the attention of the agricultural community—nor does it even now, if we may judge by what we see in the country, in anything like the degree that it deserves to do! Before we had read more than half the following article, we decided to preserve it in our journal, not for the sake of the growers of grapes—few and far between as they are—but for the very reasons that, in the close of it, we found avowed as those which had prompted the learned writer. Yes, we believe with him that 100 bushels of wheat will yet be raised on an acre, and that treble our present would have been our average crop if the sons of farmers were educated for the Plow, as carefully and thoroughly as the chosen few of the Government are now educated for the Sword, at the expense chiefly of the landed interest.

There are few gardeners now remaining who would think of growing vines in a wet border. To have it thoroughly drained is the first condition requisite for success; upon this all are agreed. But we are by no means sure that they always understand *why* thorough drainage is so essential. It is to be suspected that, in some minds at least, water is supposed to be the gardener's enemy—to be a substance quite unsuitable to plants, and of which it is the gardener's aim to get rid. Once, indeed, we overheard a "practical man" boasting of the dryness of his vine border, and telling a brother "practical" that nobody could squeeze a drop out of it. The same ingenious gentleman was found, four months afterward, besieging his acquaintances for advice how to keep down the red spider, which, as he alleged, his predecessor had allowed to get to such a head that it had almost killed the vines which he had planted in the new border that he had laid dry, with so much cleverness, in the previous spring. Luckily it is not easy to over-dry solid earth in England.

But, as we have repeatedly stated, it is the air that takes the place of water in well-drained soil, which proves so beneficial to plants; it is because air cannot reach the roots of plants, when a border is water-logged, that trees suffer. Roots require air as well as leaves, and no mistake can be greater than to suppose the contrary. It is evident that, if the crevices between the particles of soil in a garden are filled with water, air must be thence excluded; they cannot both be present, for the quantity of air dissolved in stagnant water is too inconsiderable to deserve attention. It may be enough for the maintenance of a rush or a horsetail, but not for a healthy garden plant, and least of all for a vine, whose air-vessels are perhaps the largest and most abundant of any European tree.

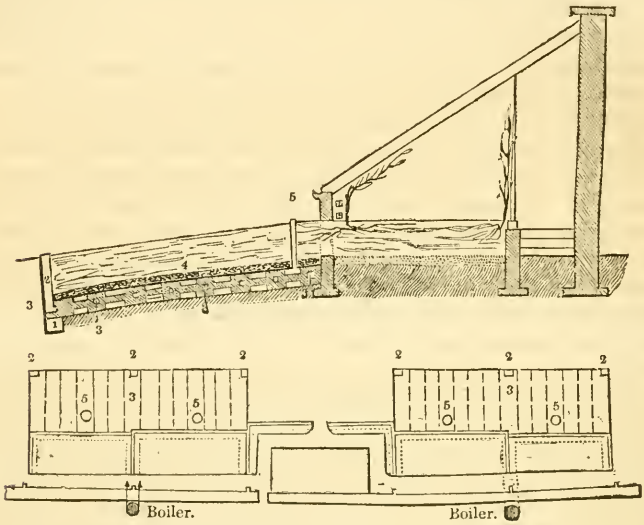
When a vine border is drained it is improved, not so much by the removal of water as by the admission of air. But the removal of superfluous water, and the free access of air, has the additional and very important effect of raising the temperature of soil. Air is a bad conductor of heat, water a good one: a border composed of porous materials not water-logged is an apparatus of non-conducting cavities, from which any heat that may be gained escapes with difficulty and slowly—once warmed it remains so, not for a few hours, but for weeks. Water, on the contrary, carries off heat with such rapidity that a water-logged border is always cold. Warm rain, falling on a water-logged soil, cannot sink into it, but remains near the surface, and speedily cools again; but warm rain falling on a thoroughly drained border sinks quickly through it, parts with its heat as it descends, and that heat is detained in the air cavities of the soil to be very gradually parted with again.

We may therefore say that a thoroughly drained border is advantageous to a vine, not because it has less water, but because it has more air and warmth.

It so happens that there exists a vine border constructed with reference to these principles—that is to say, well drained, well aired, and as well warmed as it can be by merely natural means. It is to be found at Castle Malgwyn, near Pembroke, the seat of A. L. Gower, Esq.; and is thus described in the new number of the "Journal of the Horticultural Society:"

"The bottom of the border is gently sloped from the houses to the extreme edge, where is built a box-drain extending the whole length of the border, as shown in the accompanying section marked 1; this drain is 1 foot square, the top of it being level with the bot-

tom of the border, as also shown in section. When this was completed, dwarf walls, marked 3, were built across the border, 3½ feet apart, 1 foot square, in the pigeon-hole manner; on the top of these walls are laid rough flags; these in reality form the bottom of the border, and upon these are placed about 6 inches of broken stones and bricks, marked 4, then covered with turf with the grassy side down, to prevent the soil mixing with the stones. There are flues or chimneys at each end of the border and center, communicating with the drains in the bottom, as shown in section marked 2. The top of these flues is nicely made of stone 10 inches square, through which is cut a hole of 6 inches square, into which is inserted a plug of a wedge-like form, so as to fit tightly, but removable at



GROUND PLAN OF HOUSES, AND SHOWING CROSS-WALLS BENEATH THE VINE BORDERS.

pleasure; these flues are about an inch above ground. At the back of the border are placed cast-iron pipes (marked 5), perpendicularly, and also communicating with the drains underneath; those being higher than the flues in front cause a motion in the air beneath the border. After a long continuance of rain, the plugs in the flues in front are taken out, thereby creating a great circulation of air, and thus to a vast extent accelerating the proper drying of the borders, which is deemed of much importance. In the winter season, the borders are covered with leaves and stable manure to the depth of 12 inches."

It is obvious that the whole aim of the constructor of this border was to do that which the foregoing observations show to be so important. He not only gets rid of superfluous water, but he introduces air in abundance, and at the same time the natural warmth which it carries with it. In cold or unsuitable weather he stops off the excessive admission of air.

And what is the result of this system?—Black Hamburgh grapes, *weighing from two pounds nine ounces up to five pounds a bunch*—beautiful fruit of admirable quality, on vines just seven years old.

But these principles have a higher application than the production of gigantic bunches of grapes. Had they no other value, they would be in our eyes of much less importance than we assign them. It is because they apply to all other crops as much as to the vine, that we would most earnestly call attention to them. Nor are they garden crops alone to which we refer. The farmer is more interested in the application of these principles than even the gardener, inasmuch as his stake in the land is so much higher; and he will discover, sooner or later, that it is just as possible to grow gigantic wheat crops as enormous grapes, if he will but study and learn how to apply the unvarying laws of Nature. If a bunch of grapes can be raised from 1 lb. to 5 lbs., there is nothing in the nature of things to oppose a wheat crop being raised from 20 bushels to 100; and it will probably be done. A most valuable school for farmers is the modern garden.

Longevity of the Donkey.—A donkey belonging to Mr. Gandey, of Brighton, died lately at the advanced age of a *hundred* years! It was a great favorite with its master, and was well provided for up to the time of death.

LETTER XIV.

ANATOMY AND DISEASES OF SHEEP.

Character of American ovine veterinary works—of the English...Anatomical details of the latter valuable —necessity of cutting clear from their systems of pathology and therapeutics—reasons...Exciting causes of disease even in adjacent localities in England not the same—popular superstitions on the subject...Necessarily greater differences as between remote countries possessing different climates, etc....Ravages of rot in Europe—scarcely known in most parts of America...Exciting causes apparently the same in both... Hoof-ail, though retained here by contagion, not primarily produced by the same causes as in England... Various European diseases not known here...Difference in the pathology of the *same* diseases in this country and in England...The English ones accompanied with more inflammatory action—the American of an asthenic or sinking character...Pathological differences require a corresponding difference in therapeutics ...English system of therapeutics objectionable for the above reason—on account of its expensiveness— and, for popular purposes, by the extent of its pharmacopiæ...The proper ovine veterinary system to be adopted—manner of classifying diseases...Anatomy of the Sheep—how far to be studied—directions to beginners...The Omentum...The Rumen...The Reticulum...The Maniplus...The Abomasum...The functions of the different Stomachs...The Duodenum...The Jejunum...The Ileum...The Cœcum...The Colon...The Rectum...The Mesentary...The process of digestion...The Spleen...The Pancreas...The Liver...The Kidneys...The Bladder...The Uterus and Vagina.

Dear Sir: Most of the veterinary works which have appeared in this country in relation to the Sheep, Horse, and other domestic animals, have been made up simply of medical recipes; or, if they have given systems of veterinary nosology and pathology, these systems have been mere transcripts of those of European, and particularly of English writers.

I have examined all, I believe, of the most celebrated late English authors, scientific and empirical,* on the diseases of the Sheep and their cures. For anatomical and general pathological details, the works of some of the former possess great value, and compare favorably with the treatises on the same topics by the most eminent physicians and surgeons. This is particularly true of the work on Sheep by the late Mr. Youatt—the fountain-head from which most of the later English writers on the same subject have so liberally drawn, and will probably continue so to do for a century to come. For minute accuracy of description, particularly in the department of pathology—for elaborate research into both facts and authorities —for clearness and sparkling vivacity of style, this gentleman, it seems to me, is entirely without a competitor among the English veterinarians, and his works will bear reading alongside those of a Cooper, a Louis, and a Chapman.

I have hesitated whether to transcribe entire Mr. Youatt's treatise on the Anatomy of the Sheep. It would be the sheerest affectation—not to say plagiarism—to publish a mere abridgment of his remarks, or their substance dressed up in other words, as some late English writers have done, for the purpose of setting up pretensions to that originality which Mr. Youatt has left so little room for in this department. But as these Letters, Sir, are *published* for the benefit of the *many*, rather than to instruct those already versed to any considerable extent in Veterinary Science, I have been led to doubt whether *any* systematic treatise on Anatomy is necessary. On the whole, I have come to the conclusion that farther than to exhibit the

* I do not use the word "empirical" here in its invidious sense. I mean to describe by it a class of writers *versed in experiments merely*, as contradistinguished from those who possess a scientific knowledge of physiology, pathology, therapeutics, &c.

localities of disease, explain certain operations in the animal economy, and render terms intelligible, it would be time thrown away.

In pathology somewhat, and to a much greater extent in the systems of therapeutics adopted, I have found it necessary to cut clear from all English ovine veterinarians. If this is regarded as presumptuous, I have only to say that the testimony or opinions of that man are worth little who so far pins his faith on another's views, as to disregard the plain evidence of his own senses. The salutary rule of the law is, each witness testifies to what *he* has *seen*, and to what, crediting the assertions of his own senses, *he knows*. It is for the investigating tribunal to decide what weight shall be attached to the testimony. That tribunal, in the present case, is the public.

But in reality, a discrepancy of views on the above subjects, does not *necessarily* imply an error on either side. The pathology of diseases frequently does not coincide, as between different climates and countries, and sometimes, singularly enough, between contiguous localities in the same country. This is especially true as regards the origin or exciting cause of disease. Where the atmospheric, alimentary, and all other *observable* conditions are nearly identical, occult causes which baffle the closest and most scientific scrutiny, not unfrequently either periodically or regularly, scourge man or beast with disease in one locality, while another one is almost uniformly exempt from these attacks. What English pathologist, for example, has ever assigned a physical cause which would answer, quantitatively, as a criterion to decide on the proportionable prevalence of the same malady in other regions—or the existence of which would even prove that the disease existed at all—for the frequent appearance of goitre (*bronchele*) among the inhabitants of Derbyshire, and the comparative exemption from it of the inhabitants of contiguous counties?* The theatres of its especial visitation, in other parts of the world, seem to be equally determined by chance—though undoubtedly dependent upon physical causes which have as yet eluded observation.

It is not astonishing, therefore, that the ignorant down to our own times, and even the enlightened, until a period comparatively recent, should have sought the incomprehensible causes of many diseases, in the regions of the preternatural. Among brutes especially, which were supposed to be more given up to such influences, these phenomena were conveniently assigned, by our English and Scotch ancestors, to

——"some dev'lish cantrip slight"

of "warlocks and witches"—the malevolence of an offended fairy or spiteful gnome.†

* I understand that the inhabitants of tho *adjoining* counties of Stafford, Nottingham and Leicester are comparatively exempt from the attack of goitre.

† In Burns's inimitable Tam O'Shanter, some of the singular powers once exercised

——"by withered beldams auld and droll

* * * * * *

Lowping and flinging on a crummock"—

and sometimes, though far more rarely, by "ae winsome wench and walie," to turn aside the established laws of Nature and God's providence, are thus enumerated in describing one of the diabolical sisterhood:

"Mony a beast to dead she shot,
And perished mony a bonny boat.
And shook baith meikle corn and bear,
And kept the country-side in fear."

No one will understand that the witch, in full league with the Devil, had any occasion for mortal firearms, in "shooting" the beasts of her victims. Murrain, and in some cases death, followed a glance of her "evil eye." And even the witches of Burns are tame every-day bodies, compared with those which swell the infernal *dramatis personæ* of Faust, or mingle in the gloomy horrors of Macbeth.

Two centuries ago, and even less, there was not a parish in England, a hill or dell in Scotland, or even a colonized nook in the wild woods of America, where witchcraft was not rife; and *multitudes* in every rank in life were consigned to the gallows, the faggot, strangling, &c., for this crime, by the *highest judicial* tri-

Equally unphilosophical, and not less mischievous in its effects on the progress of medical science, are those religious views, widely prevalent even at the present day, which in every epizoötic as well as epidemic scourge, recognize only a direct Theocratic infliction, operating without the intervention of physical causes. If these doctrines do not, as when carried to their full extent among the Mussulmans—who yield a passive non-resistance to plague and conflagration as the direct expression of God's will—lead to an entire abandonment of remedial measures, they at least deter scrutiny into the inducing *natural causes*, and thus occasion a neglect of all *preventive*, and a much less perfect understanding of appropriate *remedial* action.

Between countries widely separated—where their climates and other circumstances exhibit considerable differences—it would naturally be expected that still greater discrepancies would appear in their local nosology. England and the United States are subject to several corresponding ovine diseases, yet it is notorious that some of the most destructive ones of the former are unknown, or next to unknown, in the latter. The rot, according to Mr. Youatt, destroys a million of sheep annually in the British Isl-

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bunals of England and Scotland—the former presided over by such men as Sir Matthew Hale! One approved method of detecting witches was to wrap the suspected persons in a sheet, the great toes and thumbs being tied together, and then dragging them through a pond or river. If they *sank* they were guiltless—if not, their fate is thus alluded to by Hudibras in his description of the monster Hopkins, the "Witch-finder General" of England:

"And has he not within a year
Hanged threescore of them in one shire?
Some *only for not being drowned!*"

That miserable driveler and pedant, James VI. of Scotland, defended this "trial by water," inasmuch as witches *having renounced their baptism, so it is just that the element through which the holy rite is enforced, should reject them!* This pusillanimous monarch, who *shook* at the sight of a *drawn sword*, was the keenest instigator in his kingdom of tortures and prosecutions for suspected witchcraft, and he continued so after his accession to the English throne. He was often *present* at the examination of accused persons, and the Scotch juries did not dare to acquit their victims, fearing the severest punishment on themselves for "willful error upon an assize," a proceeding which left them at the mercy of the Crown, and which was in some instances actually resorted to!

The elves or fairies, the dwarfs, etc., have sorely afflicted the shepherd, as well as all other husbandmen, in bygone days. Their caprices were innumerable. Even in this, as Mr. Carlyle would say, 19th century of God's world, the ugly and monster-headed *Phaam* is sometimes seen on the lonely Kells of Galloway, and the declivities of the eastern Grampians. He not unfrequently shows himself in the dawn of the morning on the mountains around Cairn Gorm and Lochavin, and if man or beast even goes near the place where he has been before the sun shines upon it, straightway their heads swell enormously and they often die.—This is the origin of that frequent disease, the "swelled head" in sheep! At least, so the inhabitants of those regions informed the Ettrick Shepherd. (See Hogg's Shepherd's Guide.) But alas! for the gay and courtly Fairies—the very aristocracy of goblin-dom! Who would not have his flocks, yea, and his herds too, annually decimated to restore them to our utilitarianized world! Oberon, Titania, Mab, Puck and Ariel are gone! They no longer

——"on the sands with printless foot
Do chase the ebbing Neptune, and do fly him
When he comes back"——

no longer

——"in the spiced Indian air, by night,
* * * * *
They dance their ringlets to the whistling wind."

The elves of the colder regions north of the Alps, who erst danced their "roundel rites" on the banks of the Rhine and the green hillocks of Britain—who with their splendid appointments, coursers whose feet spurned the limber air, saddles of "rewel bone"

"Bryht with mony a precious stone
And compasyd all with crapete,"

outshone the splendors of Chivalry—who fought manful under shield, wounding and discomfiting even human antagonists, as related by Gervase of Tilbury, and by Heinrich von Ofterdingen in the Heldenbuch—who loved, wooed and were won much after the human fashion, and sometimes exchanged such favors with humanity, as is proved by the adventure of Thomas the Rymer under the "Elden tree"—all are gone! The wands of Scott and of Bulwer could not stay their departure! Naked, rugged-featured, unpoetical Utility has it all her own way now-a-days!

In the language of Rt. Rev. Dr. Corbett, Bishop of Oxford and Norwich in the beginning of the 17th century,

"Lament, lament, old abbeys,
The Fairies' lost command;
They did but change priests' babies,
But some have changed your land;
And all your children sprung from hence
Are now grown Puritans,
Who live as changelings ever since
For love of your domains."

ands—and in 1830–1, the number swept off much exceeded two millions.* Its ravages are equally fatal in Germany, and more so in Egypt. It is also common in France, Spain, Australia, &c. There is nothing sufficiently marked in its diagnosis to effectually distinguish it from some other diseases, to a person possessing no previous practical acquaintance with it, or no more veterinary knowledge than is common among farmers; and when a slow train of wasting symptoms have occurred, and the structure of the liver is found disorganized, after death, it is not uncommon in this country to pronounce it a case of the rot. The same mistake, according to Dr. Coventry (late Professor of Agriculture in the University of Edinburgh), is often made by even the shepherds and flock-masters of Europe.† There are other diseases besides the rot which specifically attack the integrity of the liver. Even *fasciola* or flukes in the liver, the most infallible diagnostic, to the common eye, of the rot, also, according to Dr. Coventry, accompany *hepatitis chronica*. I will not take upon me to deny that the rot ever exists in the Northern States, but I have yet to see, or hear of, adequately authenticated, the first undoubted instance; and this would go to show that if isolated cases of it do sometimes occur, it has dwindled from the wholesale destroyer of Europe to an obscure and occasional disease. The same remarks apply to existence of the disease in the Southern Atlantic and Gulf States, judging from the statements of my correspondents, and from the agricultural newspapers. I cannot learn from either of these sources that anything analogous to this malady is common in those States. According to Mr. Cockerel, of Tennessee, and Mr. Flower, of Illinois, the rot *does* prevail in our Western States; and the latter gentleman, who has, I presume, seen the disease in Europe, and who ought therefore to be familiar with its *præ-mortem* and *post-mortem* appearances, states that it occurs in Southern Illinois "from suffering sheep to pasture on land that is overflowed with water;" and he adds, "even a crop of green oats, early in the fall before a frost comes, has been known to rot young sheep."

It is worthy of remark that Mr. Livingston—equally distinguished for research and observation—does not include the rot in his list of American ovine diseases. This affords a strong corroboration of the position I have assumed in relation to the existence of this disease in the North-eastern States, and those of the Southern ones lying east of the Apalachians.‡

The Hoof-ail, though introduced here by contagion, and kept in constant existence by the same means, does not appear, in the common phrase, to *originate spontaneously*, as in Europe; or, in other words, to be excited by any other causes than contagion. I have never known an instance going, even colorably, to prove the contrary of this proposition.

Acute dropsy or Red-water, I judge to be an exceedingly rare disease in the Northern States, though the author of the American Shepherd thinks differently.||

Enteretis, or inflammation of the coats of the intestines; blain, or inflammation of the cellular tissue of the tongue; and a whole train of other diseases—including most of the frightful list of infectious or contagious European epizoötics—seem to be unknown in this country.

Why there should be so wide a difference between the ovine nosology of Europe and the United States, is a matter of curious and interesting speculation. Whether it will always remain so, or whether the advent of

* Youatt on Sheep, p. 445.

† See remarks of Dr. Coventry, quoted at some length in Mountain Shepherd's Manual, p. 20.

‡ I limit the remark to the States lying (mostly) east of these mountains, because they would probably be the only ones, at the time at which Mr. Livingston wrote, with the Sheep Husbandry of which he would be supposed to be familiar.

|| American Shepherd, p. 359.

the European diseases is only delayed here for more artificial systems of feeding, breeding, or perhaps more artificial systems of Agriculture affecting the aliment of the sheep, or other and unexplainable causes, time alone must determine.

If we look for these differences in the observable differences of climate, we find no satisfactory solution of the problem. The climate of England is essentially different from our own—but that it is a favorable one for the healthy development of all the animal tissues, her large, strong, long-lived population, as well as her well-developed animal kingdom, abundantly attest. The atmosphere of England is a moist and humid one, and moisture is thought to be one of the necessary predisposing causes of both rot and hoof-ail. Of the origin of the former disease, Mr. Youatt remarks:*

"The rot in sheep is evidently connected with the soil or state of the pasture. It is confined to wet seasons, or to the feeding on ground moist and marshy at all seasons. It has reference to the evaporation of water, and to the presence and decomposition of moist vegetable matter. It is rarely, or almost never, on dry and sandy soils and in dry seasons; it is rarely wanting on boggy or poachy ground, except when that ground is dried by the heat of the summer sun, or completely covered by the winter rain. In the same farm there are certain fields on which no sheep can be turned with impunity. There are others that seldom or never give the rot."

Mr. Youatt continues his descriptions of these predisposing conditions at great length, and his final conclusion is, in substance, that the miasmata, or gases exhaling from the decomposition of vegetable substances, are the causes of the rot. Mr. Spooner adopts the same views; indeed, they are universally received among scientific veterinarians.

If these views are correct, the evil lies not in a generally humid *atmosphere*, but in a generally or temporarily humid *soil;* and that they are true *quo ad hoc*, is proved by the fearful ravages of the disease in the driest atmosphere of Germany, in the clear, dry atmosphere of the South of France, and under the torrid skies of southern Spain, where rain does not fall for months.

Boggy or fenny soils, where decaying vegetable substances are constantly exhaling their gases, are to be found in all parts of the United States—more or less, in every township, and almost every school district of New-York and New-England. Sheep pasture on such lands, promiscuously with other stock, in every county—and, in the latter States, at least, with entire impunity from the rot.

Humidity of soil is also supposed to be the most prominent cause in *originating* hoof-ail, or producing it otherwise than by contagion. Mr. Youatt and Professor Dick attribute the disease most often to the effect of sand and dirt forced into the pores of the hoof, when macerated by moisture. The following is the language of Professor Dick:

"The finest and richest old pastures and lawns are particularly liable to give this disease, and so are soft, marshy and luxuriant meadows. It exists to a greater or less extent in every situation that has a tendency to increase the growth of the hoofs without wearing them away. . . . . The different parts of the hoof, deprived of their natural wear, grow out of their proper proportions. The crust, especially, grows too long; and the overgrown parts either break off in irregular rents, or by overshooting the sole allow small particles of sand and dirt to enter into the pores of the hoof. These particles soon reach the quick, and set up the inflammation already described and followed by all its destructive effects."†

The same writer assigns another cause for it—inflammation induced by an improper bearing of the foot, caused by the unnatural growth of the horn on wet pastures.

Mr. Spooner attributes the disease to decaying vegetables—"roots and

* Youatt on Sheep, p. 451.

† See Dick, quoted by Youatt, p. 527, 528.

leaves of the grasses in a state of rottenness"—brought in contact with the sheep's foot when "blanched and weakened by continual moisture!"*

There is another point of difference in the pathology of ovine diseases in this and the old world, judging from the details furnished by the English veterinarians. Most of the pyrexial diseases, in England, are accompanied, at least in their initiatory stages, with active inflammatory symptoms. Fever runs high, and decidedly antiphlogistic treatment is called for. On the other hand, so far as my observation and inquiries have extended, the ovine diseases of the United States are usually of an æsthenic nature—characterized by debility from the outset. The difference in the physical character, feeding, and ordinary state of fatness of the sheep of the two countries, offers, perhaps, a sufficient explanation of these facts. The gross, high-fed English sheep, forced forward by bountiful feeding to an unnaturally precocious maturity, is always in a high state of plethora, and predisposed, therefore, to inflammatory action. A slight derangement of any function, produced by a cold, by an error in feeding, or by any other causes, is sufficient to make the organs exercising those functions the seat of such action. On the other hand, the sheep of the United States, kept mainly for wool-growing purposes, is rarely raised above a moderately fleshy or medium condition. And, unexcited by an unnaturally plethoric habit, the weak vascular and muscular system of the animal little predisposes it to inflammatory disease.

A difference in the pathological character of disease requires a corresponding difference in the system of therapeutics adopted. The English system of therapeutics is decidedly objectionable, here, *first*, on the account just named; *secondly*, from its expensiveness; and, *thirdly*, (for *popular* purposes,) by the extent and complexity of its pharmacology.

1. As has been already remarked, most of the English ovine diseases commence with pyrexiæ—and the fever is synochal or inflammatory in its type. The subject is strong, plethoric, and full of blood. Antiphlogistic treatment is clearly called for. Accordingly, depletion, by bleeding or purgatives, or both, is first and promptly resorted to by the English veterinarian. In the United States, also, most important constitutional diseases commence with pyrexiæ, but the fever in its first *discovered* stage is almost uniformly of a low, sinking, typhoid type, accompanied with great prostration of muscular energy. The animal is in a leanish or only moderately fleshy condition. It has been confined to dry, and perhaps rather unnutritious food—for most of the list of constitutional maladies, here, make their attacks in the winter, and old, lean, and feeble sheep are usually the first victims. A sheep is observed drooping, and indifferent to food. It is caught and examined. Whatever organ or portion of the system is laboring under attack, bleed so as to produce a constitutional impression, (which the English veterinarians almost invariably recommend, where they recommend bleeding at all,) and follow this with an active purgative, and in four cases out of five the sheep will, in the expressive phrase of the English shepherds, "take the ground"; it will never rise from the ground more without assistance, and will soon become unable to stand when set upon its feet. Growing weaker and weaker, it soon refuses to eat, and death supervenes. These remarks are not designed to apply to stall-fed wethers, or other very high-conditioned sheep.

2. The English, and indeed the European method of treating diseases is too *expensive* for this country. In curing hoof-ail, *e. g.*, Mr. Youatt, after recommending washing in chloride of lime, and cauterizing, says:

* This seems to *me* a most unphilosophical cause to be assigned by a veterinarian of the standing of Mr. Spooner.

"If the foot has been in a manner stripped of its horn, and especially if a considerable portion of the sole has been removed, it may be expedient to wrap a little clean tow round the foot, and to bind it tightly down with a tape, the sheep being removed to a straw-yard, or some inclosed space, or to a drier pasture. . . . . The foot *should be dressed every day*, each new separation of horn removed, and every portion of the fungus submitted to the caustic." *

Mr. Spooner recommends daily, and not less troublesome treatment.† The Mountain Shepherd's Manual recommends daily treatment,‡ and this is the case, I believe, with nearly all, if not all, of the foreign veterinarians. Professor Pictet, of Switzerland, in addition to daily applications, fumigations, etc., innumerable, goes a step beyond "tow pledgets and tape bandages." He says:

"In order to prevent any dirt, &c., from getting into the wound, the diseased foot should be placed in a little boot, the sole of which is of feather or felt, and the upper part of cloth, in order to fasten it round the leg of the sheep."

This disease rages most when haying and harvesting are at their hight, in the Northern States—in July and August—and when the labor of day hands costs from seventy-five cents to a dollar per head per diem. Half the flocks in the country can then be bought for $1 25 per head. How soon *daily* parings, cauterizings, embrocations, fumigations, etc., including the expense of drugs and Professor Pictet's *gaiter-boots*, would reach an expense equivalent to the price of a *sound sheep*, it requires not the exercise of much arithmetic to determine! It would certainly be more economical to *kill* sheep of any ordinary grade in the first instance!

The same remark will apply to the English system of treating nearly all important diseases. The labor bestowed on it would be worth more, here, than the value of the sheep.

3. The English ovine veterinary pharmacopæia is too extensive and complex for popular use. The prescribed formulæ are so compound in their character—so minute oftentimes in their quantitative proportions—require so much skill for their chemical and mechanical admixture—and, lastly, and more important than all the rest, they demand so much medical knowledge for their proper and timely administration—that they can be generally used with safety and advantage only by professional veterinarians, a class entirely wanting, unless occasionally in cities, in the United States. Besides, our ordinary country drug-stores are usually lacking in many of the articles included in the European prescriptions||—and no one, without possessing considerable medical knowledge, could decide what effect it would have on the prescription to subtract this or that ingredient. It might neutralize its effects, or even render it pernicious.

A veterinary system for anything like *popular use*, in this country, must be exceedingly simple in its remedies, and in its rules for their administration. As it is impossible to describe the various symptoms which may exhibit themselves in a disease, so as to be understood by all, it is unsafe to prescribe a constant change of medicines, applicable to the several states which have caused those symptoms to appear. Indeed, changes in medicine should only be made consequent on those distinct crises of disease which can be detected and understood by the most ordinary observer. Prescriptions, therefore, inapplicable, or at least unsafe, in any stage *from one distinct crisis* of disease *to another*, should, as far as practicable, be avoided. True, such a system of therapeutics will be very imperfect, particularly in the treatment of serious constitutional maladies. But it will go

* Youatt, p. 529. † Spooner, (endorsing the views of Mr. Read,) p. 438 to 442.
‡ *Quem vide*, p. 27.
|| Not unfrequently the *most important* ones, as I know from repeated experience.

as far as the knowledge of the uninstructed practitioner will safely admit of—and if, even in cases of constitutional disease, it should simply cause him to *do no hurt by his interference*, and prevent him from resorting to some miserably ignorant empiric*—*the most important object*, perhaps, *would be attained.* It is infinitely safer in such diseases to rely on unaided Nature to effect the cure, than to submit a sheep, or any other animal, to the drugging and dosing of a person ignorant of the true nature of the disease, and of the remedies which he employs. It is better to *do too little* than to *do too much;* and in all cases where *it is not known what to do*, it is better to *do nothing.*

Lord Weston, in a letter to Mr. Bischoff, says :†

"I have little to say on the medical treatment of sheep; my study is prevention by sufficient wholesome food, with a constant and abundant supply of salt in every yard and every field. . . . . When sheep are taken ill, there is little hope for them, and rarely any use in administering medicines."

If the latter portion of this remark is true among the educated, intelligent and experienced veterinarians of England, how much more must it be so among those destitute of even the first rudiments of veterinary science! In relation to some of the more serious constitutional maladies, after considerable experience and observation, I feel constrained to express the opinion that the remark *is*, to a considerable extent, true. The sheep is almost as unsatisfactory a patient to deal with, in some such cases, as the hog, of which it is frequently said, with no great exaggeration, "that if he is seriously sick he is sure to die, and the more you do for him the sooner he will die!" "Then why give a therapeutic system at all in a class of diseases where it will do so little good?" In the first place, the cases are perhaps few where judicious prescriptions will not *somewhat* diminish the tendency to a fatal result; but the great reason, after all, is, that every man having a sick animal *will* dose and physic it, or *will* permit some officious neighbor to do so, or *will* call in that most dangerous of all *epizoötics*, the cattle-doctor. It is therefore better in the most hopeless cases, to give a few simple directions, based on sound medical principles, which will not, at all events, *aggravate the disease*, and which will *tend* to alleviate or suppress it, rather than to surrender the helpless animal over to the additional tortures inflicted by ignorance and quackery. Fortunate it is that well-managed sheep, in this country, are so little subject to such diseases!

In classifying diseases, I shall depart from the system adopted by Youatt, Spooner, etc., who arrange them with reference to the parts of the system they more especially attack, as, for example, "diseases of the brain,"

* The self-matriculated "cattle doctor" is a decidedly interesting personage. His qualifications are numerous, and it is somewhat difficult to find them all brilliantly combined in the same person. He should be the most ignorant man in the town, particularly in everything relating to the anatomy and physiology of man or beast. He should be equally ignorant of the chemical and medicinal properties of nearly all the drugs used by him. His prescriptions, to give them due potency, should consist of a great number of ingredients—a large portion of them bearing very "*hard names.*" He should flank and fortify these, at least in all difficult cases, with substances possessing rare occult virtues, entirely unknown to "human physicians," such as the "blood of black cats," the "entrails of fowls," "human fæces," simples culled under peculiar circumstances—

"Root of hemlock, digged i' the dark,
* * * * *
* * * slips of yew,
Slivered in the moon's eclipse."

He should decidedly affect the mysterious, and should always repel the attempted intrusions of ordinary humanity—the profane vulgar—into the arcana of his high art. He should have half a dozen maladies, such as "baked in the manyfolds," "overflow of the gall," "kidney disease." "rising of the lights," "strained across the loin," etc., to which he can promptly assign all the ills which beasts are heir to. He should never mistake a disease or a remedy. If the patient dies, it should invariably be in consequence of a deviation from his directions!

† Bischoff, vol. ii.

"diseases of the digestive organs," &c. This method of classification, though not without its advantages, and though it would seem, at first view, to present an arrangement most convenient for reference, examination and comparison, in the end, leads, I think, to confusion and misunderstanding.

ANATOMY OF THE SHEEP.

He who breeds sheep to any considerable extent, should make himself familiar with the anatomical structure of some of the parts of the animal—particularly with the arrangement, size, natural appearance, consistency and contents of the several viscera; to some extent with the circulatory system; with the alimentary and respiratory organs; with the brain, and the whole osseous structure of the head. He should be in the constant habit of making more or less extended examinations of all these structures, as opportunity occurs by the slaughter of sheep for economic purposes; and when the animal dies from disease, such examination should be in no ordinary case omitted by the flock-master who is *desirous of making himself thoroughly acquainted with his business.* He will require some instruction, in the outset, to enable him to make such dissections understandingly and properly; but he can readily obtain this from any educated physician or surgeon. There are no sufficiently wide differences in the anatomical structure of the sheep and of the human being, to give the surgeon the least difficulty in pointing out the arrangement, uses, &c., of the several parts of the former, unless it be in the conformation of the stomachs.—Here, the structure of the sheep, like that of other ruminating animals, differs widely from man, but that physician or surgeon must have been singularly limited in his physiological investigations, who has not made himself acquainted with it. At all events, a glance at a veterinary work, while conducting a dissection, will enable him to understand, and explain it to the learner. The learner while making his examinations in company with, and under the direction of the surgeon, should *perform every manipulation:* his own hand should handle, remove, test the consistency, &c. of the parts—alone wield the saw and guide the scalpel. This is an important rule if he would *understand* and *remember.*

The subjects of a portion of the examinations should be sheep killed in full health. It is necessary to be familiar with the healthy appearance of all the parts, so as to distinctly recognize all departures from it—the effect of any diseased or abnormal action.

The sides of a lean sheep are more translucent, after being skinned, than those of a fat one, and therefore the former makes a better subject, if the circulatory system is to be examined. On the sides of the thorax and abdomen, at a little distance from the spine, the veins and arteries of those parts can often be traced with beautiful distinctness, without any dissection of the intercostal muscles.

Subjects should be examined which have had their blood drawn (by having their throats cut), and also those which have died with all their blood in them. Some of the viscera—*e. g.* the lungs, veins and arteries—will present very different appearances under these different circumstances; and this fact not understood might frequently lead to very erroneous conclusions in *post mortem* examinations.

I will give a very general description of the parts I have mentioned as necessary to be studied—designed merely for those who have no previous knowledge of the subject.

After the animal has been neatly skinned, place it on a low table, an assistant grasping its fore-legs, and holding it firmly on its back. Then slit

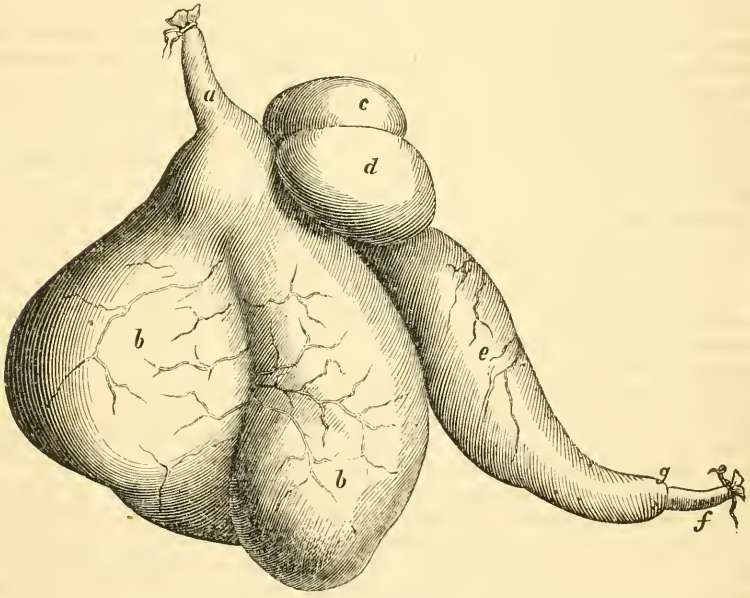
open the belly from the middle of the *sternum*, or cartilaginous connection between the ribs, to the anus. In making this and all similar incisions, hold the edge of the knife upward, guarding its point with the fore-finger, so that the viscera shall not be wounded. The abdomen—the whole cavity of the trunk back of the diaphragm or "midriff"—is now laid open. It is usually necessary for a better examination of the parts to make cross incisions part way between the diaphragm and anus, extending down on each side several inches toward the backbone.

I shall describe the viscera in the order in which I have usually examined them.

On opening the abdomen the *omentum* or caul is found covering the intestines. It is a thin, and, in a normal state, colorless and transparent structure, formed of two membranes, between which extend streaks of fat in the form of a net.

The external appearance of the stomachs is given in the following cut of those of a young sheep which died of disease. Their arrangement is slightly different in the animal.

Fig. 47.



THE STOMACHS.

a. The œsophagus or gullet, entering the rumen or paunch.
b. b. The rumen, or paunch, occupying three-fourths of the abdomen.
c. The reticulum, or honey-comb—the 2d stomach.
d. The maniplus, or many folds—the 3d stomach.
e. The abomasum, or 4th stomach.
f. The commencement of the duodenum or first intestine.
g. The place of the pylorus, a valve which separates the contents of the abomasum and duodenum.

The walls of the rumen or paunch consist of four coats or tunics—1st, the peritoneal or outer coat; 2d, the muscular; 3d, the mucous, covered with papillæ, or little protuberances, from which (or glands under which) is secreted a peculiar fluid to soften and prepare the food for re-mastication; and, 4th, the inner or cuticular coat, a thin, entirely insensible membrane, which defends the mucous coat from abrasion or erosion.

The reticulum or honey-comb is composed of the same number of coats, fulfilling similar functions. But the mucous coat, in addition to minute papillæ, is covered with elevations arranged in pentagons and sexagons of different sizes, somewhat resembling a honey-comb, except that the cells are larger and shallower.

The maniplus has the same four coats. Its *floor* is a continuation of the œsophagean canal. From its *roof* depend many parallel folds of the cuticular coat—here thicker and stronger than in the other stomachs—reaching nearly to its floor. The cuticle is covered toward the edges of the folds, with hard, bony processes, shaped like fangs, or cones bent in a curvelinear form, and pointing toward the entrance of the stomach. The interior of each fold or leaf contains muscles which impart to it the power of a peculiar and forcible motion. There are forty-two of these folds in the maniplus of the sheep—occasionally forty-eight. They do not all equally nearly approach the œsophagean canal, but are disposed in groups of six—one of the central ones of each nearly reaching the canal or floor of the stomach—the others on each side growing shorter and shorter, so as to form a series of irregular reëntering angles.

The abomasum is the digesting stomach, where the gastric juices are secreted, and where the pultaceous food is converted into chyme. It is funnel-shaped, and its lower extremity connects with the intestines, as shown in the cut. The cuticular lining of the three preceding stomachs is wanting in this. The mucous coat is disposed in the form of *rugæ* or shallow folds, arranged longitudinally with the direction of the stomach, and from this membrane the gastric juices are secreted.

The comparative size of the four stomachs will be sufficiently seen in fig. 47.

Where the œsophagus enters the rumen, it terminates in what is called the œsophagean canal, a continuation of the former constituting the roof of the latter. The bottom or floor of this canal is formed of divided portions or folds of the upper parts of the rumen and reticulum—muscular "pillars" or "lips," as they are sometimes denominated—which may remain closed so that the food will pass over them into the third and fourth stomachs—or they may open, permitting the food to fall between them, as through a trap-door, into the first and second stomachs. It is probable that the opening of these lips, as food passes over them, depends somewhat upon a mechanical effect, and somewhat upon the will of the animal. Fluid and soft pultaceous food fit for immediate digestion glide over them. But most of the food of the sheep, like that of other ruminating animals, is swallowed with little preparatory mastication; and these untriturated solids drop down through the first opening above described into the rumen. It is certain, however, that the animal can, at will, also cause water to pass through the opening into the first stomach. This would be necessary in the animal economy, and the water is always found there.

When the food has entered the rumen, the muscular action of that viscus compels it to make the circuit of its different compartments, and, in time, the food later swallowed forces it on and up to near the opening where it originally entered. In its passage it is macerated by a solvent alkaline fluid secreted by the mucous coat. The papillæ of that coat are supposed to influence the mechanical action of the contents of the stomach, and perhaps, to a certain extent, to aid in triturating them. The food performs the circuit of the stomach, and is ready for re-mastication, according to Spallanzani, in from sixteen to eighteen hours. By a muscular effort of the stomach, a portion of it is then thrown over the membraneous valve or fold which guards the opening from this into the second stomach.

The reticulum contracts upon it, forming it into a suitable pellet to be returned to the mouth, and also covers it with a mucus secreted in this stomach. By a spasmodic effort (always perceptible externally when the sheep or cow commences rumination) the pellet is forced through the roof of the reticulum, by the opening before described, and returned to the mouth by the contractions of the spiral muscle of the œsophagus or gullet, for mastication.

This explanation of the functions of the second stomach is not accepted by all the physiologists who have examined this subject. Some contend that all the solider portions of the food are returned directly from the rumen for re-mastication; that when raised to the floor of the œsophagean canal, the hard parts are carried up to the mouth—the more pultaceous ones (but still not sufficiently pultaceous for the fourth stomach) passing into the reticulum, where they are again macerated—the fluid squeezed out of them by a contraction of the stomach and allowed to pass on to the fourth stomach—and then the drier parts raised, like those from the paunch, for re-mastication. More solid and indigestible substances "may be submitted two or more times to the process of rumination." Such appear to be the views of Mr. Spooner.*

According to this theory, both stomachs are created substantially for one and the same purpose, and one would seem to be unnecessary. And where would be the use of the opening from one stomach into the other? And if the second stomach, like the first, is simply for the maceration and return of food, why the superior thickness and strength of the coatings of the former? Being of a volume greatly inferior to that of the latter, it certainly would require less strength, if the functions of both were the same.

The main support for this, as it seems to me, erroneous theory, is found in the fact that the contents of the reticulum, after death, are usually found considerably *more fluid* than those of the rumen. I conceive that but small portions of solid food are introduced at one time from the rumen into the reticulum—not enough to give to the liquid contents of the latter viscus the consistency of those of the former—proceeding on the supposition that the reticulum of the living animal is *filled* with fluid, as usually found after death. But why may not a portion of this fluid have escaped by the valve—been decanted, as it were, from the paunch to the reticulum, *after death?* I see no violence in this supposition. If this is not so, the *uniform* fluidity of the contents of the reticulum would be, it seems to me, fatal to the theory based on it—for, according to Spooner and others who adopt it, after the reticulum has "become moderately full," it contracts on its contents, expressing the liquid from the solid parts, which said liquid is forced into the œsophagean canal, and escapes into the fourth stomach. The solid parts would be thus left comparatively dry. Sheep penned up for butchery often do, as every one has observed, ruminate until within a few seconds of the time that all their natural visceral functions are suddenly suspended by death—and when, therefore, this suspension would, at times, as a matter of course, take place at all the different stages of rumination and preparation for rumination—how happens it that the reticulum is not often found with its liquid parts expressed—containing nothing but the solids, just prepared for re-mastication? Or if it be supposed that the act of forcing out the liquid, and forcing up the solids into the œsophagus, are coïncident or simultaneous, why is not this stomach *sometimes* found *entirely empty?* Can it be supposed that this fluid (I have *uniformly* found the fluid mixed with considerable quantities of the solid food) is so instantaneously re-supplied?

* Spooner, p. 162–3.

If so, by what process? I think there are other reasons which support the view I have taken, but I will not push the discussion, there not being, so far as I am aware, any questions to be solved by it which directly and practically affect the interests or the practices of the sheep-breeder.

Let us now observe the course pursued by the food, and the process to which it is submitted, after rumination. It now glides *over* the trap-doors which open into the first and second stomachs. As it passes over the floor of the third, or the maniplus, the pendant leaves of this viscus, armed with their beak-like protuberances, seize the advancing mass, and squeezing out the fluid and the more finely comminuted portions of the food which escape with it, commence triturating the bulkier fibrous portions between their folds. Their bony papillæ give to these folds something of the mechanical action of rasps, in grinding down the vegetable fibre. The food being now reduced to an entirely pultaceous state, passes into the fourth stomach, or abomasum, where it is acted upon by the gastric juice, and converted into chyme. The amount of food found between the folds of the maniplus, after death, depends upon the time that has elapsed since rumination. It is dry and hard, compared with the contents of the other stomachs.

The entrance to the fourth stomach—the *cardiac* opening—is closed against regurgation or vomiting, by a sort of valve, composed of a portion of one of the *rugæ*, before alluded to, which line the interior of this stomach. The *pylorus* is also closed by a valve, which prevents a premature passage of the contents of the stomach into the intestines.

The intestines are exhibited in fig. 48, copied from Mr. Youatt's work.

Before the duodenum enters into (or changes its name to) the jejunum, and about 18 inches from the pylorus, it is perforated by the biliary duct—*ductus choledochus*—which brings the bile eliminated by the liver, from the gall-bladder, and also the fluid which is secreted by the *pancreas*, or sweet-bread, which last is introduced into the biliary duct two inches from its entrance into the duodenum, by another duct or small tube. The compound fluid thus introduced into the duodenum exercises various important offices in the digestive and assimilating processes. The bile is supposed to aid in the separation of the chyme into chyle and fecal matter—or the nutritive parts of the food which are assimilated into blood, from the innutritious parts which are discharged as excrement. It also prevents a putrid decomposition of the vegetable contents of the intestines, and serves various other useful purposes.

The chyle—a white albuminous fluid, with a composition differing but little from that of blood—is taken from the intestines by a multitude of minute ducts called *lacteals*, which traverse the mesentary, constantly uniting as they advance, so as to form larger ducts. These enter the mesenteric glands—small glandular bodies attached to the mesentary—after the passage of which the chyle begins to change its color. The lacteals still continue to unite and enlarge, and finally terminate in the *thoracic duct*. In this the chyle is mingled with the *lymph* secreted from a portion of the *lymphatics*—another exceedingly minute system of absorbent ducts, which open on the internal and external surfaces of the whole system. From the thoracic duct, the chyle is conveyed to the heart, and enters into the circulation as blood.

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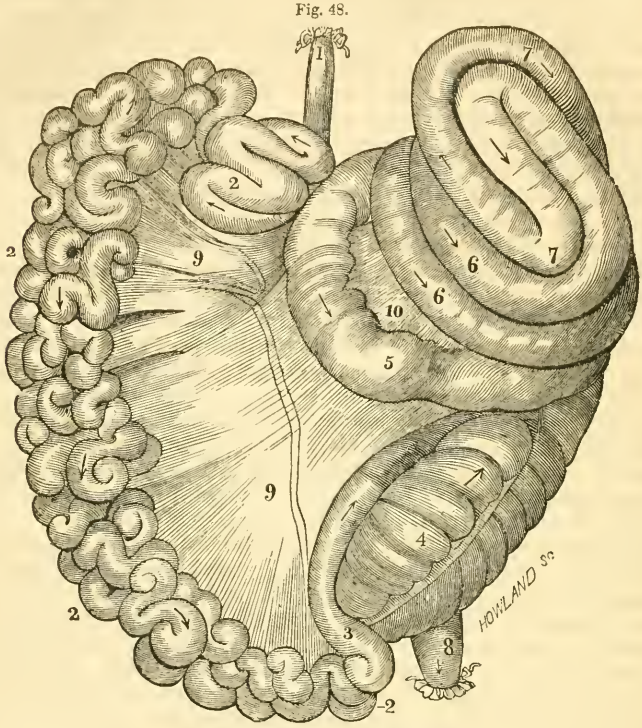
The Spleen.—With the appearance of the spleen or milt—in the sheep a dark, firm, spongy viscus, attached to the rumen, and lying on the left side of the belly—all are sufficiently familiar. Its uses and functions in

the animal economy are not well understood, and it has in some instances been removed from the living animal without the apparent derangement

Fig. 48.



THE INTESTINES AND MESENTARY.

1. The duodenum. 2. The jejunum. 3. The ileum.
4. The cœcum, being the anterior prolongation of the colon, or first large intestine. The ileum opens into this (on the back side as presented in the cut), about twelve inches from its extremity—the opening being defended by a valve.
5. The large anterior portion of the colon, retaining its size (about three times that of the smaller intestines) for about two feet.
6. 6. The colon tending toward the center.
7. 7. The returning convolutions of the colon.
8. The rectum or straight gut, communicating with the anus.
9. 9. The mesentary, or that portion of the peritoneum which retains the intestines in their places.
10. The portion of the mesentary supporting the colon, &c.
The united length of these intestines is upward of sixty feet!

of any function. Mr. Youatt conjectures that its main office is to supply the coloring matter of the blood.

—

The Pancreas.—The pancreas or sweet-bread, with the appearance of which all who have noticed the entrails of a sheep, are also familiar, is a glandular body found on the left side of the belly. It has a series of ducts which unite into a larger one, and, as before stated, this discharges a transparent, albuminous, and somewhat acid fluid into the biliary duct near the point where it enters the duodenum. This fluid acts some unknown, but probably necessary part in preparing the chyme for the offices it is to perform in the animal economy.

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The Liver.—The liver is much larger in proportion, in the sheep, than in the horse and ox; and it is twice the proportionate size of that of Man.

It is situated mostly on the right side, between the maniplus and diaphragm. It is supplied with arterial blood, and receives the venous blood which is conveyed from the intestines, from which it separates the bile, and conveys it to the *gall-bladder*. The bile having undergone certain changes in this bladder, is conveyed, as already stated, by the biliary duct, to the duodenum. The venous blood, after the gall is separated from it, is returned to the lungs, to undergo the process which fits it again to enter into the circulation.

THE URINARY AND GENERATIVE ORGANS.

Though it might seem the more natural order to complete the examination of the circulatory and respiratory organs, before taking up those named at the head of this paragraph, I shall, adhering to my first arrangement to follow the order which I have uniformly pursued in making dissections, first complete the description of those of the abdominal cavity.

THE KIDNEYS.—The kidneys are two bean-shaped glands firmly attached to the roof of the abdomen, and usually imbedded in fat. They are supplied with blood by large arteries, and, having filtered out the urine from it, they discharge the latter through two ducts, termed *ureters*, into the bladder. The passage of these ducts through the walls of the latter is in an oblique course, so that it is closed by pressure from within, and thus the urine cannot return.

THE BLADDER.—The bladder joins the *urethra*, in the pelvis, and its posterior part is attached to the floor of that cavity. The anterior part, where the diameter is larger, floats free in the abdomen. A circular muscle or *sphincter* closes the entrance into the urethra, to prevent the continuous escape of the urine, and this relaxes when the muscular coat of the bladder contracts for the periodical expulsion of that fluid. The urethra is but a few inches long in the ewe, and opens into the vagina. It is much longer in the ram, as it extends the whole length of the penis.

THE UTERUS AND VAGINA.—The vagina is several inches in length and opens into the uterus or womb by a circular opening which becomes closed after impregnation. They are situated between the rectum above, and the bladder below. They are mostly within the pelvis in the unpregnant animal, but the womb rises into the abdomen when it encloses a fœtus. The womb is a cylindrical body with two "horns" or branches. At the interior extremity of each horn are protuberances, of a red color, called *ovaries*, which are supposed to contain the germs of the offspring.

ARTIFICIAL STONE.—It is said that a process has been patented in England for making artificial stone of every quality, from artificial granite to statuary marble. The invention is stated to be founded on a chemical analysis of the natural varieties of stone. It is made of flinty and siliceous grit, rendered fluid by heat, and poured into moulds till cooled and hardened. The artificial stone has, as is stated, already been used for coping-stone, for variegated pavements for halls and rooms, stone ornaments—such as mouldings for friezes; also for grindstones and hones. The invention is thought to be particularly applicable to the lining of cisterns and water-pipes—its various qualities insuring cleanliness. The process of manufacture is said to be easy and cheap—'stones manufactured to order.'!

INK SPOTS, on mahogany, may be easily removed by rubbing them with wet blotting-paper, and afterward rubbing the spot with a dry cloth.

THE NEW-YORK STATE AGRICULTURAL SOCIETY

Held its Annual Meeting in Albany on the 19th and 20th of January. The President, Mr. Vail, stated the permanent fund of the Society to be $8,000. Mr. J. M'D. M'Intyre, the Treasurer, read his Annual Report:

Balance from last Report and receipts from various sources during the year		$6,457 19
Disbursements during the year—Premiums paid	$2,266 73	
Incidental expenses	514 78	
Library	61 22	
Salaries	947 27	
Expenses, 1846	312 88	
Other expenses	547 75	
Invested 1st October last	1,000 00	
		5,650 63
Balance on hand		806 56
		$6,457 19

Mr. Geddes, of Onondaga, gave notice that at the next Annual Meeting of the Society he would move an amendment to the Constitution so as to *exclude the ex-Presidents of the Society from the Executive Committee*, they having been added to the Board by an amendment adopted last year. We presume there must be some rule which requires a year's notice to be given in such cases, for otherwise the propriety of the measure suggested would appear to be but too self-evident. After all, however, by whom is it likely to be finally decided?

Under this amendment, making all previous Presidents (a new one every year) acting members of the Executive Committee, how many years will it be before the elective portion of the Committee will be overlaid, and the whole finances, management and influence of this State Institution be in the hands of its *life officers?* Instead of perpetual power, there should in such cases rather be perpetual rotations, in order to preserve public confidence and prevent suspicion and complaint—all unworthy and ill-founded even as we may admit these might be: in the business and affairs of this world, we must take the world as we find it—not as it ought to be. Besides, the body of water that is ever stationary is not apt to be so lively and healthful; motion is not only the sign but the source of vitality. Where there is no change of rulers, fixed ideas, long-cherished opinions and plans take the place of wholesome agitation, inquiry and progress. Even the annually elected executive officers should *rotate*, a certain number only being reëligible, enough, along with the Secretary and Treasurer, to transmit to successive Boards the history and spirit of past proceedings, so as to guard against inconsistency and to secure the execution, in good faith, of measures already projected and proclaimed. And now that we are on this subject we may venture farther to express, as far as we may presume to have an impression, that no President or officer of any Agricultural Society, especially those exercising any control over the appointment of Judges, should be a competitor for its prizes that year. True, it may be supposed that those who are such conspicuous promoters of improvements in Agriculture as to be thought of for its highest offices, must be remarkable for their excellence in many of its departments. But that by no means follows, nor is it essential, as to the Presidency. Men may be zealous friends and most efficient stimulators and promoters of practical meliorations in Agriculture, and exemplary Presidents of such Societies, and yet in

the field be very bad farmers. Such was Mr. Jefferson—such Judge Peters—the worst of all farmers, and yet they did more for the Cause than a thousand mere winners of prizes for fat hogs and big crops. Moreover, though the office should warrant the presumption of excellence, it yet more certainly should warrant an absence of all care about petty prizes, at least, for that particular occasion.

On the point of selecting Judges, for practical knowledge, impartiality and zeal, too much care cannot be exercised if we would maintain public confidence unimpaired. The following, which seems to us to be a judicious regulation, was lately adopted unanimously by a distinguished Agricultural Society in England—if it be not evidence of bad judgment as well as taste, to refer any longer to *anything English;* but this, at least, is a case not liable to the influence of Government or climate. On the score of *politics*, there is this to be said against it: it *was* moved, as we now see, by a *Lord!* But some of the most zealous and powerful friends of agricultural advancement, within our observation of thirty years, have been great Lords, and great scholars, and great statesmen, and officers of the Navy. Some of these days we will give a list of them.

Appointment of Judges.—On the motion of Lord Portman, seconded by Mr. Shelley, the following Resolution was carried unanimously: "That any member of the Society who nominates a Judge be requested to certify that of his own personal knowledge he knows him to be qualified and willing to act as a Judge for whatever classes he may be proposed to be appointed; and who is unconnected with any exhibitor of stock or maker of implements, and has no direct personal interest in the stock exhibited as the breeder of any particular animals on which he might be called upon to adjudicate: That the list of names so proposed (stating by whom proposed) be, as heretofore, referred to the Committee of the Council, whereof the Stewards of the Yard of the year preceding be ex-officio members: That in case a sufficient number of competent persons is not proposed, the Committee are ordered to add the names of such other persons as they may know to be competent and willing to act."

To proceed with the Annual Meeting at Albany:

Four o'clock P. M.—Mr. Angel, from the Committee appointed for the purpose, reported the following list of Officers for the ensuing year:

For President—LEWIS F. ALLEN, of Erie.

Vice-Presidents—1st District, Ambrose Stevens; 2d, John A. King, of Queens; 3d, E. P. Prentice, of Albany; 4th, Samuel Cheever, of Saratoga; 5th, George Geddes, of Onondaga; 6th, George W. Buck, of Chemung; 7th, Allen Ayrault, of Livingston; 8th, James C. Ferris of Wyoming.

Recording Secretary—Benjamin P. Johnson, of Albany.

Corresponding Secretary—Ebenezer Emmons, of Albany.

Treasurer—John McD. McIntyre, of Albany.

Executive Committee—Luther Tucker, of Albany; John J. Viele, of Rensselaer; Joel Rathbone, of Albany; John T. Bush, of Erie; Theodore C. Peters, of Genesee.

The Committee also recommended, unanimously, that Buffalo be the place for holding the next Annual Fair.

The Report was accepted, and the persons named elected.—Adjourned to 7 o'clock P. M.

At 7 o'clock P. M. the Society convened at the Assembly Chamber to hear an Address by Prof. J. P. Norton, of Yale College. Mr. N. gave an admirable exposition of the connection of Science with practical Agriculture. His illusrrations were numerous, and of so plain and simple a character as to be at once understood. He was listened to for upward of an hour by a very large audience, whose satisfaction was evinced by the most profound attention.

On motion of Mr. J. A. King, it was *Resolved*, That the thanks of this Society be presented to Prof. Norton for his able and scientific Address, and that he be requested to furnish a copy of it for publication.

The preceding, as well as what follows, we take from that excellent old friend of the farmer, the *Albany Cultivator*—reserving for our next, some addition to these hasty remarks. In the mean time, we cannot but wish we could command the potential voices of this State Society, and that of our worthy colleague above mentioned, to demand from Government, for *agricultural* instruction throughout the Union, even *one* out of the *many millions* which the landed interest now pays for instruction and preparation for *War*. If, say men in authority, their own organs are dumb, are we not bound to infer indifference? If, say the farmers

our own Press is silent, can we expect that of other classes to proclaim our rights? For one, while we can hold a pen, humble and powerless though it be, as long as one dollar is given to sharpen the Sword, we will demand another to brighten the course of the Plow.

At 7 o'clock P. M. the Society again convened at the Assembly Chamber, when Mr. JOHNSON, the Secretary, read the following abstract of the Reports of the Committees to award Premiums, as follows:

On Farms—1. John Delafield, Oakland, Seneca Co., $50. 2. Peter Crispel, Jr., Hurley, Ulster Co., $30. 3. James Pendil, Batavia, Genesee Co., $20. 4. Lucas V. V. Schuyler, Watervliet, set Transactions.
Draining—H. D. Spoor, Troy, $10. E. J. Woolsey, Long Island, set Transactions. E. C. Bliss, Westfield, Chautauque, Transactions 1846.
Farm Buildings—Dwelling—Mrs. Sanford Howard, Albany, $20. Piggery—S. W. Jewett, Weybridge, Vt., $10.
Cheese Dairies—Alonzo L. Fish, Cedarville, Herkimer Co., Statement of Experiments, &c., $50. Newberry Bronson, Warsaw, Wyoming Co., $20.
Butter Dairies—B. A. Hall, New-Lebanon, Columbia, $50.
Field Crops—Spring Wheat—2. Robert Eells, Westmoreland, Oneida Co., 20¾ bushels per acre, $8. Indian Corn—George Vail, Troy, 67 bushels per acre, $20. Barley—Benj. Enos, De Ruyter, Madison Co., 39 bushels per acre, $10. Oats—1. Charles W. Eells, Kirkland, Oneida Co., 86 bushels per acre, $10. 2. Benjamin Enos, De Ruyter, 71 bushels per acre, $8. Beans—E. C. Bliss, Westfield, 31½ bushels per acre, $8. Flax—Wm. Newcomb, Pittstown, Rensselaer Co., $5. E. C Bliss, Westfield, Transactions.
Root Crops—Potatoes—1. Daniel Newcomb, Pittstown, Rensselaer Co., 405 bushels per acre, $10. 2, Martin Springer, Brunswick, Rensselaer Co., 369 bushels per acre, $8. Ruta-bagas—1. Joseph Hastings, Brunswick, Rensselaer Co., 1,317 bushels per acre, $10. Carrots—1. Wm. Risley, Fredonia, Chautauque Co., 557 bushels on half an acre, $8.
Experiments—W. D. Osborn, Port Byron, Cayuga Co., on 3 acres planted with corn, 1846, $20. 1st acre manured with 10 cords barn-yard manure before corn—no manure on any part this year—Oats, 1847, 90⅔ bushels per acre. 2d acre, 1846, Corn, without manure—Oats, 1847, 88½ bushels per acre. 3d acre manured with 8 cords of manure and 4 loads of muck, 1846—Oats, 1847, 112 bushels per acre.
Fruits—Charles Lee, Penn Yan, Yates Co., 2d premium for a seedling winter apple, "Waggener Apple," $5 and Downing's common edition of "Fruits and Fruit-Trees."

After the reading of the above, the President of the Society, Mr. VAIL, delivered his Valedictory Address, which presented a flattering and encouraging view of the progress of the Society during past years, and of its prospects for the future. A unanimous vote of thanks was presented to Mr. Vail, and a copy of the Address solicited for the use of the Society.

On concluding his remarks, Mr. Vail introduced the President elect, Mr. ALLEN, who in a brief and appropriate speech, returned thanks to the Society, and signified his acceptance of the office.

Mr. BURCHARD offered some Resolutions in relation to the importance of Education to the farmer, and expressive of the advantage which would result by the establishment of Agricultural Schools in connection with Experimental Farms, which were unanimously adopted. The Society then adjourned.

January 21.—The Executive Committee met at the rooms of the Society at 10 o'clock—the President, L. F. ALLEN, Esq., in the Chair. Present, Messrs. Sherwood, Vail, Prentice, Johnson, Viele, Tucker, Stevens, Ayrault, King, McIntyre, Emmons, Rathbone, and several gentlemen from different parts of the State.

A Committee of gentlemen from Buffalo having given the usual guaranty that the expenses attendant on holding the next Annual Exhibition should be paid by the citizens of Buffalo, it was, on motion of Mr. Sherwood,

Resolved, That the next Fair and Cattle Show of the New-York State Agricultural Society be held at the City of Buffalo, on the 12th, 13th and 14th days of September next.

The Executive Committee were occupied during the day in the preparation of the Prize List, which we hope to be able to present, complete, to our readers next month.

How would it do, for the year that the State Society holds its exhibition in a County, to have its funds for that year added to those of the State, or go to help the town to pay expenses, and let one Show do for both?

May we trust that ex-President Vail's Address *has* demonstrated a steadily increasing *average* product in all the great staples from the cultivated lands of the State, since the formation of the New-York State Agricultural Society, of which this 26th of February, 1848, happens to be the *Fifty-sixth Anniversary!* In 1845 the average crops throughout the State were reported at—

Wheat	14	Corn	25	Beans	10	Turnips	88
Rye	9½	Potatoes	90	Barley	16	Flax	lbs. 100
Oats	26	Peas	15	Buckwheat	14		

Can any one inform us what they were, probably, in 1796, and decennially since?

The question is a highly interesting one, and we shall owe thanks, in the name of the agricultural interest, to any one who will throw light on it. For ourselves, we strongly suspect that the late general act of incorporation, if not too much embarrassed and trammeled with vexatious and forbidding restrictions, will do more to augment the products of Agriculture in New-York, in the next twenty years, than all the Agricultural Societies and Institutes of the State have done in the last fifty. Why we think so, we shall explain hereafter. It is not by a hundred or a thousand paltry premiums, scattered here and there, that you can have rich and waste lands cleared, and ditched, and drained, and made to yield heavy crops. You must establish, in your public legislation, a policy that will draw the consumer to come and settle *down alongside of the producer.*

SANDY-POINT FARM,

ON THE JAMES RIVER, VIRGINIA.

Several interesting sketches have appeared, particularly those from the pen of S. S. Griscom, of Moorestown, New-Jersey, setting forth the cheapness of land in the southern and eastern tide-water portions of Virginia, and their great improvability, with apparently very impartial and just remarks on their resources and natural advantages. Mr. Bolling's celebrated estate called Sandy Point has been particularly described. On the whole, it would seem to be the naked result of the grossest prejudice or downright ignorance, that carries people away from the conveniences, social comforts, proximity to market, and cheap lands, to be found in the old Atlantic States, to struggle with exposure and privation in our distant frontier settlements.

As to the *profits* of Agriculture in States as new even as Iowa, where Corn is the great staple, let the reader turn to an account of the profit and loss in that branch of Agriculture, as exhibited in another part of this number, taken from an agricultural journal on the spot, to show what is lost at corn making, when valued even at 25 cents a bushel. And yet, if our memory does not fail us (a thing, alas! too likely), we heard Mr. Clay say, last summer, that if always assured of 20 cents a bushel for corn, he would sooner make that crop at Ashland than any other, with a view to profit.

As to the health of the region referred to in Virginia, about which so much ill-founded prejudice exists, Mr. Griscom says: "I may remark here that, in the latter part of the 8th month (August), I found the people generally throughout this region in the enjoyment of health quite as good, and I think better, than in Burlington county, when I left home; and although every one agreed that the weather was more oppressive than it had been at any time previously during the summer, I did not find the mercury above 85°, and I was careful to observe the temperature. At home, in New-Jersey, at the same time, it was often above 90°."

As to *Sandy Point*, he says:

"It contains over 7,000 acres of land, of excellent neutral mulatto soil—considered, in the Essay on Calcareous Manures, as the best quality for agricultural purposes generally; it has a river front of near twelve miles; the river banks are high, with a beautiful, clean beach, and no marsh or wet land worth naming—affording many most beautiful situations for residences. The river is navigable for the largest ships, and a full mile in width, abounding in

fine fish, which can be taken all the year; and, in winter, wild geese, ducks, &c. are there in great numbers—in the forests, deer, wild turkeys and partridges are very plenty. Steamboats pass daily up and down the river between Richmond and Petersburg, and Norfolk and Old Point, where they connect with the boats to Baltimore and the North, stopping at Sandy Point for passengers or produce. A person can leave this place about noon, and be in Richmond, Petersburg, Norfolk or Old Point the same afternoon, or in Baltimore by sunrise the next morning, and in Philadelphia five or six hours later. The winters are so short and so mild that cattle and sheep need very little fodder, the grass being scarcely checked in its growth; and plowing may go on the whole year almost without any interruption. Harvest comes and fruits ripen nearly a month earlier than in the vicinity of Philadelphia. Peaches and other fruits and vegetables may be sent to Philadelphia and New-York a whole month before they are ready in the vicinity of those cities. The markets for grain are as good there as anywhere in the Northern States.

About 2,700 acres are cultivated; all having been limed, and enormous crops of clover being turned under with every plowing for a crop, it is all in a very high condition. The wheat field the present year contained 910 acres; the crop was excellent, though much damaged by a remarkably late frost, and by cold and wet weather while in bloom. A very recent letter from the proprietor says: 'Thus far we have measured 13,500 bushels, and I do not despair of getting 20 bushels per acre.' He is extremely modest in his estimates, and, from the best information I could get while there, it will considerably exceed that quantity, and equal at least 20,000 bushels. 545 acres are in corn, which is estimated to average 30 bushels per acre. All the other land is in clover of most luxuriant growth, to be plowed in as a dressing for wheat—a very small portion being cut for the stock. The whole is most judiciously divided by roads, which are skillfully and nicely graded, and kept in the most perfect order. The buildings are numerous and excellent, and well distributed: large barns, with stabling for the stock, are located conveniently over the farm; the arrangement of the stables is admirable, and they are kept in the most perfect order; the manure is constantly removed, and the floors kept covered with gypsum, so that the ammonia is immediately absorbed and preserved in the very best way to be useful to the crops; and the manure is not suffered to lie in the yards, but is hauled out and spread over the clover, which immediately covers it, and appropriates all the nutriment. All the enormous quantities of straw are spread over the clover, soon find their way through it, and by covering and keeping it moist, soon decompose and assimilate themselves again with the soil, to aid in the production of another crop of wheat. Near the river bank, a short distance west of the mansion, is the spacious barn, with steam-engine to work a saw-mill for the use of the farm—a mill for grinding corn meal—a mill for grinding plaster—and threshing-machines, which are capable of getting out and cleaning 1,000 bushels of wheat or corn in a day. This was at work while I was there, and was one of the most gratifying exhibitions I ever witnessed—its average day's work was about 800 bushels, threshed and cleaned, and put into the bins; but I was told that, under the most favorable circumstances, over 1,000 bushels could be done. The immense field of 910 acres was harvested and secured in eight days, being put up in the field in large shocks."

Aware that Mr. Bolling, in a spirit corresponding with the great extent and productiveness of his estate, had introduced the use of improved machinery, and the agency of steam, in the preparation of his crops for market, inquiries were made which elicited the following letter.

Curiosity was felt to know particularly what had been the result of his experience in regard to the *machines for mowing wheat* by horse-power, and as to the generally apprehended *danger of fire* from the use of steam in such near proximity to the farm buildings.

There need be no better proof of the inertness of agriculturists and of those who represent them in Societies, and Institutes, and Legislatures, than in the little which this great labor-saving power has yet been made to do for the landed interest; while for commerce, manufactures, and war, it saves the labor and the cost of millions. Large premiums ought to be offered by the American Institute and the New-York State Agricultural Society, to ingenious mechanics, for any new and economical *application of steam to agricultural purposes.* Were that done, we have no doubt that, before many years, we should have steam in common use all over the country—digging, plowing, ditching, sawing, felling timber, and performing for the farmer as much as it now does for the merchant and the manufacturer. Among other items of recent agricultural intelligence, a French

paper, "La Semaines," announces the invention of a steam-plow—or, rather, a mode of digging by means of steam—from which the most wonderful results are anticipated. The inventor is a young medical man, named Barat. The journal states that "one of two-horse power was in operation at the residence of the maker, who was constructing another of double that power. The machine proceeds along the field, and digs the ground with the greatest precision. Two beams, furnished with five mattocks each, act successively upon the soil, loosening it to the depth of 12 or 15 inches, and pounding it as small as compost. By using only one of the beams, a tillage of the usual depth can be effected."

Now suppose a discovery equally auspicious for manufacturers or for warlike purposes were announced, how long would it be before we should have it in use? and, since our Government disclaims all power to do anything special for Agriculture—on which, if on anything, depends the "general welfare"—why do not Associations which, under national and popular names, seek popular support, establish efficient arrangements under which, by our Ministers or Consuls, or their own agents, they should be immediately apprised of all such discoveries, with the means of introducing them for the benefit of our country?

We have pleasure in submitting Mr. Bolling's obliging reply to our inquiries, but first take room to add what Mr. Griscom says of one of our most beneficent, but *peaceful*, and therefore hardly remembered benefactors:

"One of the most gratifying incidents of my life was a visit to Beechwood, at Coggins's Point, in Prince George, the residence of Edmund Ruffin, Jr., to meet there his father, the author of the 'Essay on Calcareous Manures,' &c., late Editor of the 'Farmer's Register,'—works which will insure him the gratitude and veneration of every enlightened agriculturist, as long as works on Agriculture remain to be read. To ride and walk with him over the scenes of his early and successful experiments—to visit with him the very marl banks from which his first experiments were made—and to listen to his remarks and observations, the result of so many years of the most persevering and indefatigable labor and study—was indeed most gratifying and instructive. Here the inquirer after a knowledge of the action of calcareous manures on soils may have all demonstrated to his satisfaction; and if he will see, can no longer doubt the capacity of the soil of this region for the highest productiveness, by a judicious application of means which are abundantly supplied in almost every farm in this region."

Yes, doubtless his writings and his practical illustrations have added hundreds of thousands to the income of Agriculture and to the value of landed property in Virginia; but what does the writer suppose would be done to evince their gratitude and veneration for Mr. Ruffin, by those who are sent to represent the landed interest of Virginia in her Legislature? Does he suppose, were he to present himself in Richmond, they would rise in one body to receive *him*, and gratefully acknowledge *his* visit as an honor to the State? Not they! *His* has been but a plain, bloodless display of extraordinary zeal and intelligence, in showing men how they may retrieve their exhausted estates, and rear their families in greater comfort and respectability. *He* has never volunteered to take a life commission, with two or three thousand dollars a year, to go two or three thousand miles to carry death and destruction to the firesides of an ignorant and besotted neighboring people, who wish to be free without knowing how. Our *landed* representatives, of all parties, will tax the people hundreds of millions for war, but dare not demand one dollar for agricultural instruction.

LETTER FROM R. B. BOLLING, ESQ.

HUSSEY'S AND McCORMICK'S MOWING-MACHINES—STEAM-MACHINE FOR CLEANING WHEAT—PRODUCE OF VIRGINIA LANDS.

SANDY POINT, Charles City County, Va., Dec. 11, 1847.

My Dear Sir: Your favor of the 3d was forwarded to and received by me here a few days ago. Feeling the importance, largely engaged as I am in ag-

ricultural pursuits, of labor-saving machines, and especially of wheat-reapers, (wheat, as you know, being one of the two great staples of the *lower* James, and corn the other,) I embraced the earliest opportunity to make trial of both Hussey's, of Baltimore, and McCormick's, of Virginia. The latter, after a trial, to me satisfactory, made in the presence and with the aid of a vender, I condemned and rejected. The former I was induced to buy, now four or five years ago, regarding it as superior to the McCormick, though very far from being an efficient machine, and without farther and very great improvements, it cannot supersede, on our large farms, where laborers can be had, the cradles. My last was the largest crop I ever reaped, and the season the driest, coolest and most favorable for the use of the reaper, yet with one of Hussey's machines, equal to any I have seen, (though he may have made *recent* and I trust valuable improvements,) in my barn, I was induced to use it for a few hours only, to gratify a practical mechanic of your city, by name Ransom Smith, a clock manufacturer and a man of great mechanical skill and taste, who happened here, to whom I would refer you. While I am as yet without an approved and efficient reaper—which, propelled by steam or some other power than horse, I regard as the great desideratum (if attainable) on the valuable and extensive farms on the lower James River especially—I have successfully and most satisfactorily introduced in my barn a steam-engine of fifteen horse power only, by which I thresh, chaff and clean, ready for delivery, my wheat, employing scarcely any manual labor, beyond the feeder and one or two hands to attend to the straw as it passes from the rakers over revolving drums upon a network of common cord to the point—150 feet from the barn—where the straw is received, for the *first time*, by hand, and put in long ricks, where it is preserved, until it is finally hauled, as provender and litter for various kinds of stock, and as covering or top-dressing for the young clover—in which mode much the largest quantity is annually used with the *most marked and gratifying results*. Besides threshing my wheat and cleaning and conveying it by *elevators*, as in a merchant-mill, from the basement to the garret, as often as it may be necessary, to cleanse it from impurities, or in case of a wet season (which very often occurs) during harvest, or before the wheat can be housed, to keep it in motion and prevent it from *heating*, the engine drives my corn-sheller, and at the same time the fans, which prepare the corn for shipment, together with one pair of 4½-feet stones, by which I am supplied with meal for my domestic uses, an upright saw, (a circular would be better,) a pair of 4-feet stones to grind plaster, and a pair of crushers or stampers for the preparation of bone-dust, with which I am now making experiments (if, indeed, the use of bone-dust can any longer be regarded as an experiment) upon wheat, turnips, &c. All these various and important operations are, in turn, economically performed in the same building, and, with the *exception* of the mere *threshing* of the wheat, can as well be performed in wet and inclement weather, as in dry and mild. Without this silent, potent and economical agent, which I trust will soon be as common in this as it is in the old country among agriculturists, I should not be enabled to grow the crops which by its aid (indirectly) I not only raise but clean. While others, in July, are threshing with *their* teams, I am enabled to employ *mine* in the indispensable and all-important work of fallowing my clover fields for a succeeding wheat crop, and am in this way only enabled to give the necessary and *timely* preparation to a large surface, on which to sow my seed. My engine-room is in immediate contact with my barn, which has a brick gable only, though the engine-room is wholly of brick, and fire-proof. Few sparks are emitted, from the construction of the chimney, and these few so light as to lose all power of doing mischief, even were they to come in contact with the straw, which is conveyed to a remote point, and in a different direction. Many here, like yourself, expressed fears as to fire, but an inspection has never yet failed to remove them.

I have hastily, though I trust intelligibly responded to your two inquiries respecting, first, the wheat-reapers, and then the use of steam, in many of my agricultural operations.

I learn from you with more regret even than surprise, as great as it was, that your subscription in Virginia did not average a subscriber or more to each county.*

[* No; not more, probably, than 100 in the whole State; although we have proffered them the most voluminous, profound and highly illustrated works for less than one-quarter of their prime cost. We had

To me it is a source of inexpressible mortification and regret to see the great interest of Agriculture in this highly favored State so little appreciated by her citizens. Blessed with a soil and climate equaled by few States in the Confederacy, and certainly surpassed by none, and abounding, in almost every point, with that invaluable, and indispensable, and wonder-working agent, carbonate of lime, in some one of its forms, Virginia ought to rank among the foremost of her sisters in the various productions so well adapted to her soil and geographical position. Were the *same* means employed, and industry and zeal displayed here, that I witnessed this summer in a delightful trip to the States of Delaware, New-Jersey, Pennsylvania, New-York, Connecticut and Massachusetts, I feel assured, from my own results, that we should be much more bountifully rewarded for our expenditure of time and money; and this opinion I express with much confidence, after having enjoyed the opportunity this summer at the State Fair, at Saratoga, of conversing with many intelligent farmers, and comparing notes. None there with whom I had the privilege of conversing, were enabled to report a yield of 31 bushels average of wheat upon 160 acres, after clover fallow. Yet Mr. Hill Carter, of Shirley, made that quantity upon his field of that size in 1845. In Pennsylvania, and in beautiful and fertile Chester and Delaware Counties, 20 bushels per acre, upon ten or twenty-acre lots, were regarded as their maximum crops. Mr. Wm. Harrison of Brandon, and Mr. John Selden of Westover, often exceed that yield upon fields of from 100 to 200 acres. I this past season averaged 23 bushels on 500 acres. Could we increase the readers of our excellent agricultural journals—and no one feels a greater desire to aid in the effort than myself—we should soon witness gratifying and beneficial changes among our farmers. With the sincerest wishes for the universal dissemination of your journal among us and others,

I am, dear Sir, very respectfully, ROBERT B. BOLLING.

[There are few subjects on which erroneous impressions are more prevalent than as to the comparative condition and produce of farms in the North and in the South—say New-York and Virginia, for instance. The common impression south of the Chesapeake is that twenty bushels and upward of wheat to the acre, are ordinary yields in New-York; whereas, by her last Census, taken with something like care by the State officers under State legislation, in 1845, only *one* county averaged twenty bushels; and that county (New-York) had—or so reported—but three acres in that grain. Out of 59 counties, only ten averaged over fifteen bushels, and the whole State fourteen of wheat, twenty-six of oats, nine and a half of rye, and twenty-five of corn. We much doubt if in New-York, or Pennsylvania, there can be found, on the same scale, any exhibition of Agriculture that evinces more thorough judgment and forecast, on the part of the proprietors, or equal perfection, neatness, and thorough work, in the execution and detail of practice in the field, than may be witnessed on the large estates referred to in the above papers. Why does not the Virginia Legislature provide for exact periodical returns, decennially, at least, of all her agricultural statistics. Would not the time and money be as well spent as in some other ways that might be mentioned? And how can wise and just laws be enacted without such periodical and accurate returns? *Ed. Farm. Lib.*]

Smut in Wheat.—N. Simons, of Castile, New-York, states in the Genesee Farmer that he took six fine heads of wheat, and three of them he rubbed out and sowed with as many heads of smut. The product was two-thirds smut, as was found by counting the heads in the crop. The other three heads were sown on a clean place remote from the others; not a particle of smut was produced. This experiment entirely accords in the result with others, showing conclusively the importance of clean seed.

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supposed there were counties that would, and still believe there are single counties in Virginia that ought to give more patrons for such a work than it has received in the whole State. Of course we don't speak of the Editorial portion of it. *Ed. Farm. Lib.*]

THE POTATO ROT.

"Rot me," as the boy says, if—after giving what follows, from the London Gardeners' Chronicle—we trouble the reader with anything farther on this subject for a twelvemonth to come—unless either Professor Norton, Mr. Teschemacher, of Boston, or Professor Lindley himself, should aver that something new and of practical utility, to be relied on, has come to light:

Dr. Buckland's letter on the Potato Disease, together with those of Mr. Wilkinson and Sir Gaspard le Marchant, has revived the vexed question of how the disaster was produced. It reminds us of stories current in Ireland in October and November, 1845, when it was firmly believed by many persons, that the mischief was produced by lightning. There was one case in particular of a field sloping to the sea-shore, on the north-east coast, the whole of which was blighted in a night, and fishermen who were lying off the coast that night declared that the surface of the field seemed light with gleams and coruscations.

We are far from venturing to assert that some peculiar electric condition of the atmosphere has been the real cause of this scourge; but we are equally far from denying it. We think, too, that evidence of the disease being connected with some peculiar atmospheric condition of a deleterious nature, acquires more and more force as time wears on, while at the same time the arguments to the contrary become weaker and weaker. The peculiar affection of the tomato in 1846, which, as far as we saw, was confined to the side of the fruit freely exposed to view, and consequently to direct atmospheric influence, seems to corroborate the views of Dr. Buckland and Mr. Milne.

At all events it appears certain that unless this visitation is removed by Providence, it is not likely to disappear; for the skill of Man has been directed in vain, not merely to its removal, but even to its mitigation. If it proved to be last year less destructive than in 1845 and 1846, the change can hardly be referred to any human cause. Time has now permitted a trial of the various remedies which have from time to time been proposed in different countries, and the result is that all, without a single exception, have failed.

The most complete series of experiments hitherto made public is that tried last year in the Garden of the Horticultural Society, and reported upon in the Society's "Journal," just published. In the absence of a clue to the first cause of the disease, experiments are necessarily empirical; and therefore every kind of remedy, probable or improbable, which had been heard of, was put to the test, from charcoal up to soap jelly. The results must, we imagine, show the hopelessness of dealing with an enemy so capricious in its attacks that a result obtained in one place is directly reversed in another place only a yard or two off—there being no appreciable difference in soil or situation or circumstance. For example, the per centage of diseased potatoes found where *nothing* had been used in the soil was as high as 32·50 and as low as 5·74. And although in the cases of some applications no disease whatever was found when the crop was taken up—nevertheless in many instances the very same applications were found connected with above 50 per cent. of disease. The following Tables, abridged from Mr. Thompson's Report, will make this still clearer:

Substances employed.	Rate per cent. diseased.
1. Lime and charcoal	13·24
2. Do. do.	20·66
3. Do. do.	18·24
Average of the above three rows	17·38
4. Nothing	20·88
5. Do.	29·40
6. Do.	21·92
Average of the above three rows	24·06
7. Salt, lime and charcoal	31·05
8. Do. do.	22·81
9. Do. do.	13·77
Average of the above three rows	22·54
10. Nothing	23·00
11. Ash-leaved kidney, young tubers grown	
12. in 1837 planted	24·00
13. Nothing	8·50
14. Watered with weak chloride of lime	17·52
15. Do. do	19·28
16. Nothing	32·50

Substances employed.	Rate per cent. diseased.
17. Salt, potash, and fat	12·17
18. Sulphuric acid, diluted (half row)	5·19
19. Powdered charcoal (half row)	7·73
20. Salt	3·86
21. Coal-tar sprinkled over the sets	3·70
22. Nothing	6.65
23. Chalk, salt and charcoal	4·45
24. Do. do.	6·89
Average of the above two rows	5·67
25. Sulphate of soda and nitrate of soda	14·64
26. Salt successively applied	6·44
27. Do. do.	7·50
Average of the above two rows	6·97
28. Sulphur	6·03
29. Salt and sulphate of magnesia	9·38
30. Do. do.	7·36
Average of the above two rows	8·37
31. Moberly's sulphate of magnesia	12·26
32. Sets dipped in lime	7·70

Substances employed.	Rate per cent. diseased.
33. Sets sprinkled with quicklime	17·27
34. Soot	16·21
35. Oil-cake (half row)	9·23
36. Nothing (half row)	11·52
37. Powdered charcoal (half row)	12·43
38. Nothing (half row)	14·71
39. Sets dipped in boiling water	7·39
40. Sets dipped in lime and dung-water	11·90
41. Do. do.	15·02
42. Do. do.	8·94
43. Planted alternately with beans	11·90
44. Crushed oil-seed (half row)	10·51
45. Nothing (half row)	5·74
46. Powdered oil-cake (half row)	3·48
47. Nothing (half row)	8·30
48. Shaded by Indian corn	14·12
Average of all the rows to which nothing was applied	18·11
49. Potash, salt, fat and water	53·03
50. Do. do.	1·38
51. Do. do.	0·0
52. Sulphuric acid	0 to 12·28
53. Sulphate of magnesia	0 to 4·19
54. Chloride of lime	0·23 to 4·27

In some cases where sulphuric acid was used the disease disappeared, but the crop was nearly destroyed.

The most remarkable result was that of the application of a soap jelly, a mixture of potash, fat, salt and water, an American remedy. When applied to plants set whole in hills, layered and earthed up repeatedly, the potatoes treated with this mixture were in some cases free from disease, but in other cases the per centage of tainted tubers amounted to as much as 24·44, and *when they were not earthed up* to even 53·03, or to an average of 21·32 in 30 experiments. It is therefore a question whether the advantage which in some cases appeared to belong to the soap jelly was not in reality attributable to the mode of treatment.

Seedlings, concerning which so much obviously unfounded expectation was entertained, proved no more exempt from disease than old and long-cultivated varieties, as is shown in the following Table:

	Rate per cent. diseased.
1. German seed from Baden, sown in gentle heat April 3; planted out April 30	9·64
2. Ditto	15·84
3. Seed from Mussooree, sown in the open ground, March 18	25·00
4. Seed from Mussooree, sown in gentle heat April 3; planted out April 30	18·42
5. Seed from Poland, sown in gentle heat May 24; planted out June 16	13·94
6. Seed from Poland, sown in the open ground, May 24	47·36
7. Ditto	72·82
8. Ditto	47 01
9. Seed from Maldon, Essex, sown in the open ground, March 18	29·44

Neither did the wild potato escape; on the contrary, a perfectly wild form of the root, fresh from its native mountains, is reported to have "exhibited the characteristic blotches in a worse degree than any other sort in the garden." In short, the conclusion which has been arrived at from the Horticultural Society's experiments is "that there is no known preventive of the disease; that neither renewal by seed, nor introduction from foreign countries, nor treatment in the earth, afford any guaranty against its attacks; and that its progress cannot, in the present state of our knowledge, be resisted with such success as to justify the recommendation to the public of any of the remedies hitherto proposed."

These facts surely point more strongly than any argument to the impolicy of encouraging the cultivation of the potato, except as an aid to human subsistence, along with other and more hardy varieties of food. Its very productiveness when healthy evidently leads to the most awful social calamities in the event of failure; and if the cultivation of the plant is persevered in, Europe can expect no respite from those dreadful visitations which we are told by the very able and well-informed author of the "Irish Crisis," in the Edinburgh Review, has produced no fewer than seven partial or general famines in Ireland during 26 years, viz., in 1822, 1835–6–7–9, and 1845–6, or one in every three or four years. If the richest country in the world would sink under such a series of disasters, what must be the inevitable condition of the poorest?

We repeat, then, that the cultivation of the potato, by the poor, for their main subsistence, should be discouraged in all possible ways; and that, on the other hand, the encouragement of other articles of food should be the first and most serious object of all humane persons throughout the United Kingdom; for there is not the slightest security that the present disease, when it shall have disappeared, will not be succeeded by one quite as formidable.

[We may thank Providence that with our Indian corn there is no danger that *roots* should ever be the basis of popular subsistence in our country. How dreadful would it be to have the whole nation, as in Ireland, live in habitual and constant dependence on such a diet, with nothing to fall back upon in case of disease and scarcity. But even that is not all. It is impossible for a nation that looks, for its subsistence, to one such single and simple culture and preparation, of its food to advance in civilization and the arts. The main impulse that

prompts physical and intellectual exertion and improvement is that feeling which arises between the satisfaction and the renewal of hunger—and where the animal wants are so easily satiated as in Ireland, by digging and throwing into the pot a small measure of roots, there will be, among agriculturists, comparatively no intellectual progress. Variety and refinements in the processes and variety in the staples of Agriculture, and Horticulture, and cookery, and progressive civilization march on together. Leave a nation with redundant crops of Irish potatoes as the great element of subsistence, and cut them off from intercourse with more refined people, and they would sink into barbarism and go naked, if the climate would allow. There are, says a writer in a late magazine, thousands of Irish families in whose cabins now the only furniture is, a pot to boil the potatoes, and the door taken off the hinges and laid across the bottom of an inverted wicker-basket for a table. Long, then, may we have the *murphies* as a luxury, but never as a necessary of life. We would sooner see them become extinct.

Ed. Farm. Lib.]

HOUSEWIFE'S DEPARTMENT.

GARDENER'S CALENDAR FOR MARCH.

We copy, by permission, the following from "Landreth's Rural Register and Almanac," published by Lea & Blanchard. David Landreth has, it seems, succeeded to the management of the old establishment, founded by his predecessors, (of whom his father was the principal,) more than half a century ago, and, as is stated, "with the determination to sell nothing but what they fully believed was worthy of credit; and that they might the more certainly accomplish their object, determined to produce, as far as possible, the seeds which they should vend; experience having shown them that most imported seeds could not be relied on, and much less those casually collected, and sold to dealers.—The result was as they had foreseen:—unlimited public confidence. The concern thus conducted, has been gradually enlarged, and is now, as it has been for many years, the most extensive of its kind in America; supplying not only much of the demand in the Middle, Western and Southern States, but exporting to the West Indies, South America, and the British Possessions in Asia."

Personal acquaintance with the proprietors, successively, justifies the expression of our highest confidence in the practical experience and sound integrity with which this respectable concern is conducted; and it needs no argument to show that the public interest is always to be promoted by the continued support of such establishments, (got up at great expense and many years of labor,) when they are found to be managed with skill, integrity, and fairness as to prices. On the other hand, dishonest seedsmen are to be accounted and stigmatized as among the most mischievous of all impostors.

Some readers may be surprised to see this subject introduced under the *Housewife's Department;* thinking it more properly belongs to the husband's; but those who are familiar, as we profess to be, somewhat, with rural life, and the habits that characterize it, must know that, were it not for the wife, the *garden,* no less than the poultry-yard and the dairy, would, in most cases, be most sadly neglected. Nor, in fact, while we yield to none in reverence for the character

and position of the judicious and sensible Housewife, do we see anything unseemly or incompatible in her possessing that knowledge of Horticulture, and of the practical management of the Garden, and Nursery, and Orchard, which are all indispensable to a good supply and regular succession of vegetables and berries and fruits for her table. Too often does it occur by the death, and, alas! sometimes by the indolence or worse habits of another, that much coarser and more onerous duties than those which belong to the dairy and the garden, devolve on the widow or the wife. On this ground, a knowledge of what belongs to these departments may well be coveted and aimed at by every well-bred woman of good sense, while personal attention to them may be safely recommended, were it only on the ground of their tendency to promote health, by that exercise in the open air which their performance superinduces; and no less on the score of that mental expansion and improvement which may be expected to follow when these duties are pursued with some attention to the principles and the laws of Nature, that belong to and regulate the growth of peas and strawberries, and the manufacture of bread and of butter, no less than the revolution of the Earth, the ebb and flow of the tides, and the motion of the heavenly bodies.

The difficulty that most frequently stands in the way of an adequate supply of butter, and poultry, and vegetables, and fruits, and the want of which should be esteemed disreputable in every country establishment, is not so much that the Housewife is either too indolent or too proud to give to such matters her personal attention—though truth compels the acknowledgment that such is *sometimes* the case—but it much more frequently results from unwillingness and failure in *another quarter*, to supply the means and the help that are indispensable.

It is a maxim among all men of sense, that whatever is worth keeping is worthy of being well kept; and in no case is this more emphatically true than in respect of all that belongs to the *Housewife's Department.* No more can blood be got out of a turnip, than chickens from hens, or butter from cows, or vegetables from gardens, or fruit from orchards, where little or no provision is made for feeding them—no houses or fences for their shelter and protection, and no force supplied for their cultivation and management. What say you, dear Madam? We almost fancy we hear you answer, as Sammy Veller says, "them 's my sentiments."

Well, with the blessing of Providence, as long as we can hold a pen, and enjoy the honorable privilege of giving counsel in what concerns your Department, we will stand up for its dignity, its importance, and its title to respect and support; and yet more, because even yet more important, it shall be our pleasure, as it is our duty, to throw into the columns appropriated to your particular use, what may appear to us best adapted to qualify you for, and give you "aid and comfort" in the discharge of that highest of all human functions—*the office of Mother!*

GARDEN CALENDAR—MARCH.—If the spring be forward there is a busy scene: ground is to be dug for the early sown crops; roots, shrubs and fruit-trees are transplanted, running vines are shortened and secured to their supporters, walks newly graveled, or covered with tan, edgings reset. Peas are sown. Potatoes for the early crop planted. Windsor and long-pod beans planted; a few early radishes and beets sown on a warm border. Cabbage and lettuce plants from the autumn sowing are set out. Cauliflowers may be set out, if you are provided with boxes to protect them. Asparagus seed sown and beds may be made. A small sowing of early turnip may be made. The hot-beds will now require more water, air is indispensable; if kept too close the plants will be *drawn* and unable to bear transplanting.

This and the succeeding month are favorable for transplanting fruit-trees. If the reader have occasion to purchase, let us caution him against doing so from any but a responsible nurseryman:

above all, avoid *auction trees:* the most worthless in the nursery are frequently selected for those sales, and with attractive names sent to some distant point, where the purchaser cannot have redress when the deception practiced on him is made evident—which, perhaps, is not until after years of careful culture.

Another important matter connected with this subject, is the method in which the trees are planted. Let it be done deliberately and with care. If the ground in which you are about to plant be of an indifferent quality, provide a liberal quantity of rich earth for each tree, and cast aside that which is taken out of the holes. For an ordinary sized nursery tree, the holes should be four or five feet across, and nearly as many deep; the excess in depth to be filled up with good earth provided for that purpose; when all is ready place the tree in the center of the hole, with the roots and fibres spread out horizontally or fan-shaped, and as the finely pulverized earth is shoveled in, shake the tree gently to admit the earth among the fibres. When the hole is filled up to the proper level, the tree should not stand more than a couple of inches deeper than it did before removal, which can be readily determined by the color of the bark. A stout stake to keep the tree steady is highly useful, and if the ensuing warm weather be dry, give a little water from time to time—or what is even better, protect the surface of the ground for a few feet around the tree with litter, or any other material which will give shade and arrest evaporation.

In the Carolinas and farther south, continue to plant peas and beans, transplant the remaining cabbage-plants from winter beds; remember that to have fine head cabbage or lettuce, very rich land is requisite. Sow onions and leeks. Sow a few turnips, they may succeed. Plant potatoes. Sow carrots and parsnips, if enough were not sown last month. Radishes may be sown from time to time throughout this month. Sow small salading, such as mustard, cress, curled lettuce, at least once a fortnight. Sow parsley, if not enough. Sow tomatoes in a warm situation; the tomato-plants from the hot-bed may be set out. Sow peppers close of the month. Plant water and citron melons. Plant cucumbers. Okra may now be planted, also squash and pumpkin-seed. Beets and other root-crops sown last month will be advancing; they should be thinned and cultivated. Sow celery, spinach, fork or dress asparagus-beds, if not already done—set out strawberry-beds. Artichokes, if not slipped and dressed last month, should be farther attended to. Hoe and thin the turnips which were sown last month. Potatoes will now be coming forward; they should be kept clean and earthed up. Weeds will now make their appearance—an early application of the hoe will save much labor.

Green-House and Flower-Garden Calendar—March.—*Vinery,* keep a high, moist temperature, and syringe frequently. *Geraniums* water freely; give them an airy situation, and as near the glass as possible, to prevent *drawing. Hyacinths, tulips* and *croeus,* continue to water freely, and tie the flower-stems to neat stakes—*azaleas* begin forcing; increase the supply of water and air generally, fumigate frequently to destroy the green fly. *Annuals* sow in hot-beds.—Prune out-of-door Roses. *Lagerstromeæ* head down to four or five eyes, and give them an airy situation.

If any can be found at this day to doubt the great importance of having the female mind better stored with useful knowledge, let him reflect for a moment on their increasing agency in the great work of education, and his doubts must cease.

In Massachusetts, where the subject of Education is best understood and most efficiently provided for, the proportion of female over male teachers has been for the last ten years constantly increasing, until now the number of female teachers, we believe, more than doubles that of males, there being more than 5,000 of the former so employed; and as to their fitness for the task, it would be superfluous to add to the opinion of the distinguished Secretary to their Board of Education, who says on this point that he is well satisfied that the gain to the children in mind and manners, under female instructors, has been in full proportion to the economy that attends it.

We should do injustice to our own feelings, not to say of Mr. Mann, in this connection, that in any community having a just conception of the *true* sources of civilization and social happiness, his services in the cause of Education entitle him to stand in the front rank of public benefactors; and yet were he in the greatest extremity of need, it may be doubted whether Congress would give him a soldier's patent for a quarter section of land. Such is the wise and accurate discrimination of the rulers of a Republican land. Even these female teachers, whose labors are devoted to the instruction of the rising generation in the principles of knowledge and virtue, get but $13 50 per month, and find themselves; while a common hireling in the trade of human slaughter gets his board and clothes and $10 a month, and a farm of 160 acres of land, picked out of as many millions.

For this department we have chosen, for variety, the following short moral tale, that too nearly corresponds—oftener than many know of—with what is every day taking place in real life.

MARY WILLIAMS.—A Tale.

In the neighborhood of a small town in the south of England there came to dwell, some years ago, a young mother, whose family consisted of a boy six years old, and a lovely little girl three years younger. She was a stranger to the inhabitants; and there was about her something of mystery, which the uncharitable interpreted to her disadvantage, and which prevented even the kindly from warmly interesting themselves in her fortune. Her name was Mary Williams.

Mary Williams lived for some time unknown and unnoticed. She intimated her wish to maintain her family by receiving the children of her neighbors to instruct in the rudiments of education and in their Christian duties: but no pupils presented themselves. She desired to be employed as a seamstress; but no work was offered her. Mary saw her little savings visibly declining; she sometimes looked upon her children with a sad foreboding, and wiped the secret and unbidden tear from her sunken eye.

The inmates of the cottages which surrounded her little dwelling were excessively curious to know the history of Mary Williams. She was seldom seen in the daytime, for she was employed in instructing her little boy, who was docile and industrious; or she was endeavoring to conceal the approaches of poverty by additional care in the preservation of their garments. She and her children were still ever neat and clean. But on a summer evening she sat in the garden in front of her door, and listening to the prattle of her loved ones, endeavored to forget the cares which had removed the bloom from her cheek. It was at this hour of repose that the gossips would sometimes come around her. Their manifest intention was to break through the reserve which she had resolved to maintain. They sometimes made her feel bitterly; but she was not uncivil to them; and they generally went home with an impression that Mary Williams was a singular young woman, but that there was no harm in her.

Mary still wanted employment. The full difficulties of her situation now became visible to her. A few shillings only remained to provide for the necessities of the passing week. But she had still the comfort of feeling that she had not been improvident, and the equal satisfaction of knowing she was not in debt. Her spirit did not sink; for she had been accustomed to place a firm reliance on the mercy of the Most High; and she looked for a sure relief to the Almighty Protector of the widowed and the fatherless.

One day that her last shilling remained to her, Mary Williams determined to make a more strenuous effort to procure work as a seamstress. Should this fail, her only resource was to engage herself as a servant, and bestow all her earnings upon her children. But she dreaded a separation. She therefore resolved to conquer her natural timidity, and to solicit that assistance which she felt that she could honestly ask. She stated her case to several tradesmen. Their first question was, "Are you a widow?" She could only answer by her tears. The conclusion was, that her children were illegitimate, and that she was unworthy. She returned home without success and almost heart-broken. For the first time she sat down, and sobbed aloud in the presence of her children.

Her little Susan clung around her with unconscious indifference; but her Henry felt and shared her grief. "Mother," he said, "you have told us that God will take care of us, and why do you cry?" "My dear boy, that is the last loaf of bread I have the power to procure; and must I see you starve, my children, oh, my children?" "My dear mother, that is sufficient for to-day, and God will take care of to-morrow." The afflicted parent remembered the promises of Scripture: she kissed her children, and wiping her tears, fell on her knees, and silently prayed for a short space. She then turned to her Bible and read aloud the sixth chapter of Matthew. She confided in the promises of her Redeemer, and laid herself down to sleep in the tranquillity of innocence and of faith.

In the morning Mary rose with a resigned heart. She had sufficient left for the first meal of her household; and she sat down to her scanty fare with thankfulness, in the assurance that her "heavenly Father," who "feedeth the fowls of the air," would supply their future wants. They had scarcely breakfasted when a lady of mild and benevolent appearance entered the cottage. "I have heard," said she, "of your necessities and your desires. But I love sincerity; let me know your history without reserve, and if you are deserving, you will not want a friend."

There was something in the manner of this kind visitor that told Mary Williams she had no idle curiosity to shrink from; she felt that her prayers had been heard. Dismissing her children, she respectfully requested the lady to be seated, and in a faltering voice commenced her narrative. She was a woman of good sense and strong feeling; she spoke from her heart, and therefore she at once produced conviction, and obtained pity.

"Oh, Madam!" she said, "I have perhaps been wrong in keeping my sorrows to myself and in thus exposing myself and my poor children to want, it may be to reproach; but though I blush not for my own crimes, I blush for the fault of one I loved, the father of those dear little ones. I was the only daughter of a decent tradesman; a good man, but not a rich one. He died and left me a little money. I was too young and inexperienced to engage in his business; I conquered my false pride, and determined to go to service. About the time that I had formed this resolution, a young man who had been apprenticed to my father returned to town. He possessed many good qualities, which blinded me to the evil parts of his character. I knew that his passions were violent, and that he was habitually indifferent to religion. He paid his addresses to me; and I fondly thought that my influence as a wife might become the instrument of his reformation. We married; and by the help of friends engaged in the occupation which my father had followed. For a short time we were tolerably happy; but my husband neglected the public worship and the private duties of a Christian. My little boy was born. I became more importunate to my husband to think seriously. I could not bear that my child should have an example of irreligion in his pa-

rent. For oh, Madam! if the world smile upon us, and our path be smooth, and riches increase, and pleasures surround us, there will still be a void, if the heart is not with God; but if sorrows come, and sickness fall upon us, and poverty gather round us, and the world forsake us, where shall be our hope, but in those 'treasures in Heaven, where neither moth nor rust doth corrupt?' I was perhaps too importunate to my unhappy George. He became averse to my society. He began to be connected with loose companions. Our business went on badly: we got in debt; my little Susan was born; and" (she covered her face with her hands and wept for a minute) "my little Susan was born, and—my George forsook me." The kind visitor took Mary affectionately by the hand, and implored her to compose herself. After a little pause she resumed her story.

"For the sake of my children I bore up against my sorrows. I endeavored to carry on our business, but I was unsuccessful. Affairs got worse. I called the creditors together. They were kind and considerate. They would have had me continue my shop, and would have accepted a small compensation for their debt. But I was determined not to risk their property. I sold everything, and paid my debts to the extent of my ability. I had a trifle left. I opened a school. My neighbors supported me; and I could have brought up my family: but my poor boy began to hear about his unhappy father. A thoughtless urchin one day told him that his father was a rogue. I thought my child's heart would have broken. I determined that my little ones should not be made wretched by the knowledge of their parent's shame: I gave up my school and came hither, where I was quite unknown. It is my husband's parish; and though I would not willingly become burdensome, I would not, in the extremity of misery, for my children's sake, refuse that support which the merciful laws have provided. May this last sorrow be spared me!"

Mary looked up in her visitor's face and saw that she was in tears. The good lady said nothing; but pressing her hand, left the cottage. In an hour she returned, followed by several children. "Young woman," she said, "I have the fullest confidence in you: these are the children of my servants and tenants; take them under your instruction; make them as good and as religious as yourself; it will be my duty to provide that your care shall procure a competence."

Mary Williams entered upon her duties with alacrity. The liberality of her patroness soon placed every reasonable comfort within her reach. In a few years a female school upon an extensive scale was committed to her charge; and she saw herself the possessor of a neat house, a prolific garden, and an income beyond her well-regulated wishes. Her children were her great solace. They both manifested the best dispositions. Though she sometimes wept at the recollection of the blight which had withered her early love and her domestic happiness, she poured out her thanksgivings when she looked upon her boy and girl, saying in her heart, "Did ever any trust in the Lord, and was confounded? or did any abide in his fear, and was forsaken? or whom did he ever despise that called upon him?"

The benevolent clergyman of the parish had assisted Mary Williams in the education of her boy: at the age of fourteen he possessed a deep sense of piety, upright principles, and a cultivated understanding. His kind friends undertook to apprentice him. He served his master faithfully and diligently. Susan had grown up into a blooming girl. She was devotedly attached to her mother, and looked forward with delight to the prospect of assisting her in school. They both considered themselves orphans; for the faint remembrance of his father had passed across the infant mind of the boy as an incoherent dream; and the mother, though she never forgot her George, thought it her duty not, as yet, to impart to her children the knowledge of a parent's crime. She had never heard of him, except that he was gone to a foreign country.

Henry had been apprenticed three years, when his master offered him permission to pass a few days with his mother and sister, at the season of Christmas. He gladly accepted the kindness. On the eve of the celebration of the Redeemer's nativity, the happy boy and girl went forth in their joy to collect holly and misletoe from a neighboring wood, with which they proposed to adorn their mother's cottage. The air was bitterly cold, but they hurried along in the cheerfulness of their health and innocence, unmindful of the blast, and unthinking of sorrow or penury. Their happy talk was interrupted by the moan of a fellow-creature. They looked round and saw a famishing man lying by the wayside. The principle of humanity was natural to them; they did not stop to deplore his sorrows, but they hastened to relieve them. The afflicted man spoke not. Henry was a strong lad, and his feeling for the wretched gave him additional strength. He raised the sinking traveler from the earth, and with his sister's aid, slowly conveyed him toward their mother's cottage.

Mary Williams was engaged in preparing a frugal entertainment to welcome her Henry on the approaching festival. Her boy and girl stayed from home until the night had closed.—She became anxious. The door at length opened, and her children appeared, supporting a fainting and emaciated stranger. She looked a smile of approbation, and prepared to assist in the Christian duty of relieving the wretched. They seated the perishing man by their cheerful fire, and hastened to procure a cordial. The stranger opened his dim and weary eyes. Mary gazed for an instant; and then with an agonizing shriek fell upon his neck. It was her cruel, her prodigal, but her once-loved George.—She forgot her wrongs; she thought only that he was the father of her children; that he was, perhaps, a dying penitent.

The wretched man was slightly roused at this act, but he speedily relapsed into unconsciousness. Mary's good sense pointed out to her the necessity of caution; she tore herself away and ran to implore a neighbor's assistance. She represented the afflicted man to her friend, and to her children, as one whom she had recognized as a dear relative. Rest and nourishment were prescribed to him: in a few days he became sensible to the attentions which were shown him; but he was visibly dying.

With an affectionate regard to his health, Mary did not dare to trust herself in his presence But the anxious Susan was his constant nurse. The child's sense of the consolation of religion was habitual; and she therefore thought it her duty to read the Word of God to the afflicted man. She and her brother were yet ignorant of the relation which he bore toward them, though they perceived that their mother was deeply interested in his fate. The unhappy man

was at first pained by this endeavor of the lovely and innocent girl: he was next indifferent; but when he sometimes heard her, as she fancied him asleep, praying for his recovery, and as the morning and evening hymn of that pious household came upon his ear, his mind gradually changed; and he at length listened with attention to the inspired Word which the affectionate child delighted to read to him. He was particularly regardful of those consolatory passages which proclaim the efficacy of a sincere repentance, and recalled his interesting instructor again and again to the parable of the Prodigal Son. He one day burst into a flood of tears, and requested to see a minister of God.

The heart of his yet unknown Mary rejoiced at this determination. She hurried to her kind pastor, and at once explained the wish of the afflicted man, and the circumstances of her relation toward him. The clergyman entered the room of sickness. The penitent sufferer briefly detailed how the thoughts of religion had been awakened by the dear child who attended him, and without reservation related the cruelty of his conduct to his wife and children. He had suffered every species of calamity, which he hoped might be some atonement for his crime; and his greatest anxiety was to hear whether those beings whom he had so injured were alive. If he could receive their forgiveness he should die happy. The kind minister gradually revealed to him that his daughter now stood beside him, and that a superintending Providence had permitted her to be the instrument of his repentance. It is impossible to paint the affecting scene which followed. The son, and lastly the wife, of the afflicted prodigal were introduced to him; and amid the tears of all present, (the good clergyman not excepted,) his Mary gave him the most solemn assurance of her forgiveness and her love. He lingered a few days and then expired.

THE FARMER'S DAUGHTER.—There 's a world of buxom beauty flourishing in the shades of the country. Farm-houses are dangerous places. As you are thinking only of sheep or of curds, you may be suddenly shot through by a pair of bright eyes, and melted away in a bewitching smile that you never dreamt of till the mischief was done. In towns and theaters, and thronged assemblies of the rich and titled fair, you are on your guard; you know what you are exposed to, and put on your breast-plate and pass through the most deadly onslaught of beauty safe and sound. But in those sylvan retreats, dreaming of nightingales, and hearing only the lowing of oxen, you are taken by surprise. Out steps a fair creature—crosses a glade—leaps a stile. You start, you stand lost in wonder and astonished admiration! You take out your tablets to write a sonnet on the return of the Nymphs and Dryades to earth, when up comes John Tompkins, and says, "It 's only the farmer's daughter." What! have farmers such daughters now-a-days? Yes, I tell you they have such daughters. Those farm-houses are dangerous places. Let no man with a poetical imagination, which is only another name for a very tender heart, flatter himself with fancies of the calm delights of the country—with the serene idea of sitting with the farmer in his old-fashioned chimney corner, and hearing him talk of corn and mutton—of joining him in the pensive pleasure of a pipe and jug of brown October—of listening to the gossip of the comfortable farmer's wife, of the parson and his family, of his sermons and his pig—over a fragrant cup of Young Hyson, or capped in the delicious luxuries of custards or whipped creams—in walks a fairy vision of wondrous witchery, and, with a curtsy and a smile of most winning and mysterious magic, takes her seat just opposite. It is the farmer's daughter, a lively creature of eighteen; fair as the lily, fresh as May dew, rosy as the rose itself, graceful as the peacock perched on the pales there by the window; sweet as a posy of violets and clove gillivers, modest as early morn, and amiable as your own imagination of Desdemona or Gertrude of Wyoming. You are lost. It 's all over with you. I wouldn't give an empty filbert or a frog-bitten strawberry for your peace of mind, if that glittering creature be not as pitiful as she is fair. And that comes of going into the country, out of the way of vanity and temptation, and fancying farm-houses nice old-fashioned places of old-fashioned contentment! ["The Hall and the Hamlet," by William Howitt.

THE BACHELOR'S COMPLAINT.

Returning home at close of day,
Who gently chides my long delay,
And by my side delights to stay?
Nobody.

Who sets for me the easy chair,
Sets out the room with neatest care,
And lays my slippers ready there?
Nobody.

Who regulates the cheerful fire,
And piles the blazing fuel higher,
And bids me draw my chair still nigher?
Nobody.

When plunged in dire and deep distress,
And anxious cares my heart oppress,
Who whispers hopes of happiness?
Nobody.

When anxious thoughts within me rise,
In sore dismay my spirit dies,
Who soothes me by her kind replies?
Nobody.

When sickness racks my feeble frame,
And grief distracts my fevered brain,
Who sympathizes with my pain?
Nobody.

Then I 'll resolve, so help me Fate!
To change at once the single state,
And will to Hymen's altar take—
Somebody.

MADDER IN OHIO.—An Essay has been received, kindly prepared for The Farmers' Library by Mr. BATEMAN of the Ohio Cultivator, on the Culture and Yield of Madder—but not in time for publication in this Number. It will appear in the April Number, with some remarks of our own.

The quantity of Madder imported into Philadelphia and Baltimore, from the 1st of January, 1845, to 1st of January, 1847, and into New-York from the first named date to the 30th June, 1847, was 16,804,714 pounds, valued at $1,620, 415. To hoodwink the Agriculturist, (which all politicians know to be an easy matter,) and to have something to swear by and say, that this article, to the growth of which the soil and climate of many States are both perfectly well adapted, Congress, (composed in great part of representatives of Farmers,) have graciously laid on it a specific duty of *five per cent. ! ! !* What the *Agricultural Committees* were about when this very encouraging duty was laid is not known. Virtually they might as well have been, as they are always politically—*fast asleep!*

LIME AND PLASTER.—In Scotland, where the climate is so much more moist than in the United States, plaster or gypsum is of little use, but lime is very important. Gypsum is of great utility in the drier climate of America; but would not a parity of reasoning show that lime might be used to excellent advantage on our wettest soils?

PRICES CURRENT.

[*Corrected, February 26, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47-8 ℔ 100 lb	5 93	@	6 —
Pearls, 1st sort, '47-8	8 37½	@	8 50
BEESWAX—American Yellow	— 22	@	— 23½
CANDLES—Mould, Tallow.. ℔ lb	— 12	@	— 14
Sperm	— 32	@	— 33
COTTON—From ℔ lb	— 6½	@	— 9¼
COTTON BAGGING—Kentucky	— 15½	@	— 16
CORDAGE—American ℔ lb	— 11	@	— 12
DOMESTIC GOODS—Shirtings, ℔ y.	— 4½	@	— 9
Sheetings	— 6	@	— 15
FEATHERS—American, live	— 35	@	— 40
FLAX—American	— —	@	— 9
FLOUR & MEAL—Genesee, pure, bbl.	6 31½	@	6 37½
Genesee, from Western Wheat	6 12½	@	6 25
Troy	6 12½	@	6 18¾
Oswego	6 12½	@	6 18¾
Michigan	6 12½	@	6 25
Ohio	6 12½	@	6 25
Brooklyn and New-York	— —	@	6 —
Brandywine	— —	@	— —
Georgetown	6 —	@	6 12½
Baltimore, Howard-street	6 —	@	6 06¼
Richmond City Mills	— —	@	— —
Richmond Country	6 —	@	— —
Alexandria	6 —	@	— —
Fredericksburg, Petersburg City	6 —	@	6 25
Rye Flour	4 —	@	4 12½
Corn Meal, Western and State	3 12½	@	— —
Corn Meal, Jersey	2 56¼	@	2 62½
GRAIN—Wheat, White ℔ bush.	1 32½	@	1 37½
Wheat, Red and mixed	1 18	@	1 25
Rye, Northern	— 88	@	— 90
Corn, Jersey and Northern yel	— 54	@	— 57
Corn, Southern, white	— —	@	— —
Corn, Western, flat yellow	— 57	@	— —
Oats, Northern	— 47	@	— 49
Oats, Jersey	— 40	@	— 42
HAY—North River in bales, ℔ 100 lb	— 65	@	— 70
HEMP—American, dew-rotted.. ton	130	@	140 —
" " water-rotted	160	@	190 —
HOPS—1847	— 5½	@	— 6½
IRON—American Pig, No. 1	30 —	@	32 50
" Common	28 —	@	29 —
LIME—Thomaston ℔ bbl.	— 75	@	— 80
LUMBER—Boards, N.R., ℔ M. ft. clr.	35 —	@	40—
Boards, Albany Pine ℔ pce.	— 10	@	— 19
Plank, Georgia Y. Pine. ℔ M. ft.	27 50	@	30 —
Staves, White Oak, pipe. ℔ M	60 —	@	— —
Staves, White Oak, hhd	45 —	@	— —
Staves, White Oak, bbl	33 —	@	35 —
Staves, Red Oak, hhd	28 —	@	32 —
Hoops	27 —	@	32 —
Scantling, Eastern	17 50	@	20 —
Scantling, Oak	30 —	@	35 —
Timber, Oak ℔ cubic foot	— 22	@	— 25
Timber, White Pine	— 18	@	— 22
Timber, Georgia Yellow Pine	— 30	@	— 35
Shingles ℔ bunch	2 50	@	2 75
Shingles, Cedar, 3 feet, 1st quality.	28 —	@	34 —
Shingles, Cedar, 3 feet, 2d quality.	27 —	@	32 50
Shingles, Cedar, 2 feet, 1st quality.	20 —	@	25 —
Shingles, Cedar, 2 feet, 2d quality.	18 —	@	22 —
Shingles, Cypress, 2 feet	18 —	@	22 —
Shingles, Company	35 —	@	38 —
NAILS—Wrought, 6d to 20d ℔ lb	— 10	@	— 14
Cut 4d to 40d	— 4¾	@	— 4½
PLASTER PARIS—℔ ton	2 50	@	— —
PROVISIONS—Beef, Mess, ℔ bbl	8 25	@	9 —
Beef, Prime,	5 25	@	6 —
Pork, Mess, Ohio, old	9 —	@	9 25
Pork, Mess, Ohio, new	10 —	@	10 12½
Pork, Prime, Ohio, old	7 —	@	7 25
Pork, Prime, Ohio, new	8 25	@	— —
Lard, Ohio, new ℔ lb	— 7¾	@	— 8½
Hams, Pickled	— 6	@	— 6½
Hams, Smoked	— 7¾	@	— 9
Shoulders, Pickled	— 3¾	@	— 3¾
Beef Hams in Pickle	10 —	@	11 —
Beef, Smoked ℔ lb	— 6½	@	— 6½
Butter, Orange County Dairy	— 20	@	— 22
Butter, Western Dairy	— 16	@	— 18
Cheese	— 6	@	— 7½
SEEDS—Clover ℔ lb	— 7	@	— 7½
Timothy ℔ tierce	16 —	@	18 50
Flax, Rough	10 25	@	10 50
SOAP—New-York ℔ lb	— 4	@	— 7
TALLOW—American Rendered	— 8½	@	— 8¾
TOBACCO—Virginia @ lb	— 3	@	— 7
Kentucky and Missouri	— 4	@	— 7½
WOOL—Am. Saxony, Fleece, ℔ lb	— 42	@	— 47
American Full Blood Merino	— 38	@	— 40
American ½ and ¾ Merino	— 33	@	— 36
American Native and ¼ Merino	— 28	@	— 30
Superfine, Pulled Country	— 33	@	— 35

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MARYLAND AND VIRGINIA,

COMPARED WITH MASSACHUSETTS AND RHODE ISLAND IN THEIR AGRICULTURAL AND DOMESTIC CONDITION AND POLICY.

AGRICULTURAL FAIR AT EASTON, MARYLAND, OCTOBER, 1847.

The accounts which have appeared of this last exhibition of the zeal, industry and taste of our friends in that region, of which we shall speak in another place more particularly, have been highly favorable and auspicious; nor is there any good reason to be given why it should be otherwise—for it would be an egregious error to attribute any defect of improvement to any general want of knowledge of the means by which such improvement can alone be secured and accelerated. Still grosser, perhaps, would be the mistake that should ascribe any such deficiency to want of industry on the part of the Farmers generally, in the district referred to, or in the State at large. Our personal knowledge enables us to assert the contrary.

When we hear so much about the "ten-hour system" of labor in cities, and demagogues make themselves hoarse in decrying the hardship and oppression that would require more than ten hours' labor in the day from the poor mechanic —and yet more when we see these poor mechanics, wearied out with sitting around a new building, twirling their thumbs, until the clock strikes to go to work *according to the rules* of the Trades Union—we often think of the Agricultural Laborer, who, without the power of combination or the disposition to complain, rises at 5 and drudges on, with brief intervals, until at least 6 P. M., making at the least 13 hours: the master and farmer over all being, as he should be, the first to call all hands at dawn of day, and the last to see all snug after dark. From daylight to dark is the measure for him without whose products all other classes would perish and disappear from the face of the earth.*

No! it is not so much for want of knowledge or of diligence that Agriculture

* Here it may repay the trouble to note the difference in the pay and the labor of the town mechanic and the agricultural worker. Take the gardener, for instance. In digging a square perch of ground, in spits of the usual dimensions, (7 inches by 8 inches,) the spade has to be thrust in 700 times, and as each spadeful of earth, if the spade penetrate 9 inches, as it ought to do, will weigh on the average full 17 pounds, eleven thousand nine hundred pounds of earth have to be lifted. As there are 160 perches or roods in an acre, in digging that measure of ground the garden laborer has to cut out 112,000 spadefuls of earth, weighing in the aggregate 17,000 cwts., or 850 tons, and during the work he moves over a distance of 14 miles. As the spade weighs between eight and nine pounds, he has to lift in fact 1,278 tons—equal

languishes, in any part of the country with which we are familiar. This decline, or stationary condition, results, in our judgment, from defective legislation, the tendency of which is to disperse instead of concentrating our population according to its natural increase, at least on the seaboard. Much more frequently than agriculturists are aware, *the policy and action of Governments*—State and Federal—silently influence their condition and blight their prospects. The policy most congenial to the prosperity of the farmer, is that which most directly tends to bring the manufacturer and all other *consumers* of the fruits and products of his labor, nearest to his farm, so that as little time may be lost, and as little money expended in the business of exchange as possible. Perhaps no country exists, unless it be exclusively a Cotton country, from which a greater proportion of its products is carried entirely away and sold off the farm than from the Eastern shore of Maryland—indeed from all Maryland and Virginia; leaving but little, even of its offal, to replenish the land on which it grew. It has no consumers near at hand except its producers, or not one-fourth as many as it ought to have, with its manufacturing power, and chiefly, hence, no increase, but rather a *falling off of population for forty years!* How fortunate for that noble region of country—we allude to the Eastern shore of Maryland and Virginia, destined by Nature apparently to be, from the Capes of the Delaware and Chesapeake up to the Pennsylvania line, but one garden and orchard, and dairy and poultry-yard and butchers' shop for the large cities that encircle it—how fortunate for the landed interest of all that peninsula would be a steady, undeviating, not party but national policy that should force, by the power of an obvious self-interest, all the manufacturers now employed abroad in the manufacture of the hundreds of millions of goods imported into Baltimore, Norfolk, Philadelphia and New-York, to come with their capital and machinery and settle down in New-York, New-Jersey, Pennsylvania, Delaware and Maryland!

A great variety of articles, fruits and vegetables, would be made, and many of them consumed on the ground, in the production of butter and cheese, and pork, and poultry, and beef and mutton, in lieu of the wheat and other things that are now sent away, and that, being less bulky and perishable, are now made in the Far West, and can be brought into market in competition with them at small cost for transportation. Potatoes and turnips, and cabbages, and carrots, would be sought for or consumed on the spot, to sheep and hogs, and cows and bullocks.* The manure would be returned, the land enriched, rich swamps would be cleared up, and marshes and meadows drained; population would concentrate instead of dispersing. The *spread* of it would be slow and only as the wholesome fruit of actual redundance; and, above all, schools would multiply, teach-

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to more than 2,500 *hogsheads of tobacco!* An able-bodied laborer can dig ten square perches a day—in doing which he lifts 177,500 pounds—for which he gets an average, perhaps, of 75 cents and finds himself; while the carpenter and brick-layer, with their jack-plane and trowel, get at least $1 50 to $2. Is it any wonder that the current of emigration sets always to the towns?

* At a late Agricultural Meeting in the Legislative Hall in Boston, Mr. Proctor, of Danvers, stated that the price of carrots there was $8 a ton, and that 35 tons had been grown to the acre, and that "32 were not uncommon"—$256 to the acre! These carrots are either sold to consumers very near, or probably fed to pigs and cows, and the manure kept on the farm to enrich it, and the pork, and milk, and butter, and cheese sold off. What would the farmer do with the carrots in Virginia? How much time, and force, and expense to get them to market, if any could be found, at a great distance over bad roads?

Immense factories are driven by steam in Newburyport, Mass.; why not in Annapolis—in Richmond—in Norfolk—in Alexandria—in Georgetown? It is a great mistake to suppose that even white labor cannot be found; it can be found, and *cheaper* than in New-England. Set the pot of honey, and the bees will soon come to it.

ers would be *prepared* specially for their noble calling, and be more respected and better paid, as they should be. With improved education, we should have improved morals, and the whole community, as it would increase in the sum of its knowledge, would possess in like proportion an accumulation of productive capacity, and a higher character for all that gives to communities the power of local and social attraction.

Should not every community covet and take measures to secure the reputation and general intelligence and prosperity enjoyed by New-England, where free trade in money and a large proportion of consumers, give men the ambition and the means to have it said of them, as was said by an accomplished foreigner—De Tocqueville—sent out expressly to examine and report upon our social and political institutions? Hear his testimony:

"In New-England, every citizen receives the elementary notions of human knowledge; he is, moreover, taught the doctrines and the evidences of his religion, the history of his country, and the leading features of its Constitution. In the States of Connecticut and Massachusetts, it is extremely rare to find a man imperfectly acquainted with all these things, and a person wholly ignorant of them is a sort of phenomenon."

Why, then, farmers of Maryland and Virginia, do you not look into these things—break away from leaders and demagogues—learn to think for yourselves, and demand of all in authority to enact, as a permanent National measure, a Protective Tariff, that shall force the foreign manufacturer to relinquish, now and forever, all hope of supplying us with his goods, until he comes and plies his shuttle and his forge within hearing of our plows—that the products of the one may be taken, as directly and inexpensively as possible, in exchange for the other; instead of the present ruinous system, under which your lands are condemned to lie idle because there is no market for a thousand things that would pay well if the consumers were at hand to demand them! As the system works at present, three-fifths of the value of what you do make, is lost in the act of exchanging for the things for which it goes in payment. Hear, on this point, the declaration of the accomplished Editor of the New-Orleans Bulletin, in the very heart of the Cotton and Free Trade region:

"We buy," says he, "in New-Orleans, negro cotton goods manufactured from one bale of cotton, for about the same sum that we *receive for five bales* of raw cotton; the other four bales being for the labor and profits, which are divided between the ship-owner, Northern or English operatives, mill-proprietor, agents, and commission merchants—all of which would be retained at home, for the benefit of our own citizens, had we cotton-mills *established here*."

But who will risk his capital in the establishment of cotton-mills, that may do well under the laws of to-day, and ruin all concerned under the different policy and legislation of a new dynasty to-morrow?

"Since 1843, millions of dollars," says a writer on the spot, "have been invested and expended in Pennsylvania in the erection of furnaces, forges and rolling-mills; and thousands and *tens of thousands* of men have found employment at wages which have remunerated toil in the various branches of business connected with this trade, and in the extension of our internal improvements. These important interests and these cheering prospects have been sacrificed; and thousands of men and their dependent families, we fear, will soon be temporarily left without the means of subsistence."

"Temporarily left without the means of subsistence!" and what next, good reader? What is the only resource which the policy of the Government—the Representatives of the *Landed Interest*, those who make your laws—what is the resource left for these "thousands of dependent men and their families"? Exactly that, and that only, resource which has been draining your population and leaving you with millions of uncultivated lands on the seaboard for half a cen-

tury. Their natural and only resource is to go away West, and turn *rival producers of your staples*, because they are your only staples—Corn and Wheat—that may be made with little force and transported cheaply in kind, or on the hoof, to market. Thus you see your Government policy—your public legislation—tends to scatter population and make all producers, leaving you no dependence but an overstocked and ruinous market at home, or a more precarious and ruinous one abroad.

Patrons of this journal! are we traveling out of our latitude in discussing questions like this, which lie at the very foundation of your condition? Or shall we forever and forever harp on stale matters of making corn and wheat, and how to plant potatoes, and how spread manures, all of which you know quite as well and a little better than many who undertake to teach you? Or shall we surfeit you with accounts, a thousand times repeated, of how some monstrous bullock has been fattened at enormous cost into a mass of slush, weighing 4,000 pounds—or a single acre made to produce what others were made to do fifty years ago? Shall we treat you as children, to be amused with humbugs, or as men, ardently seeking new and valuable information? We confess this last is most to our own liking, and most what we feel we are ourselves in want of. Much more do we and you want to know what will concentrate instead of scattering and driving off your population, and how you can get the nearest and most remunerating market for such things as will pay well if sold near at home, and that cannot be made in rivalry with you—as wheat and corn can, even to the very foot of the Rocky Mountains. Were it necessary to look for high authority to justify us in pressing such topics on the attention of the agricultural community, in an agricultural journal like this, and to plead the example and the doctrines of a traveler of sagacious and profound observation—and withal a Southerner and friend of Free Trade, where Free Trade is practicable—we might quote the remarks of Hon. J. R. Poinsett, addressed to—whom do you suppose? Not to politicians and legislators, but to the *Agricultural Society of the State of South Carolina*—a body as enlightened as the same number of cultivators, or of any class, to be found in any State or country on earth, except lately, since the kindred sciences have been applied to Practical Agriculture in England and Scotland. Hear what Mr. Poinsett says of the effect of the presence of Manufacturers on the Agriculture of a country:

"Both from observation and reflection, I am convinced that a State entirely destitute of Manufactures, whatever may be the extent and nature of its staple productions, will always be inferior to one that combines manufactural industry with agricultural wealth. In the first place, materials to a very large amount, which might be worked up to advantage, but which will not bear the cost of distant transportation, are wasted for want of neighboring manufactures. In the next, it is destitute of those towns and villages that grow up around such establishments, affording home markets for the produce of the farmer, more advantageous than those at a distance, and supplying him with necessary articles at a cheaper rate, the price being diminished to the amount of the cost of transportation. Again, manufactures greatly increase the productive resources of a country; the use of steam and water power, and the vast number of mechanical contrivances and labor-saving machines set in motion by them, augment to an almost indefinite extent the productive industry of the country; while every discovery in science applicable to the useful arts which manufactures give rise to, adds still farther to its wealth. It is true that the application of Science to Agriculture has increased its products, and that we have some few labor-saving machines, but how few and insignificant are they when compared with those that multiply a thousand-fold the industrial capital of a manufacturing district! Where manufactures exist, the individuals interested in their success and prosperity, from their proximity to each other, easily unite their efforts for all purposes of common interest, and good roads and canals result naturally from such combinations, and convenient lines of communication are everywhere established, so as to give to each one his fair share of the advantages of trade. We, on the contrary, live far apart, and meet

but rarely to take into consideration our common interests; and when we do meet, we remain together too short a time to originate or perfect any great measure of general improvement. In purely agricultural districts, therefore, the products of industry find their way to market by miserable roads and circuitous lines of communication, to the great loss and inconvenience of the farmer."

Let us suppose two farmers, each with an estate of equal extent and fertility, the owners equal in management and intelligence—but one of them has within a mile a miller to grind all and his family to eat a part of his corn; the tanner to buy his hides and to buy his pork in return; the shoemaker to make his shoes and buy his milk; the weaver to sell him cloth and buy his wool; while the other would have to send his corn to be ground and his hides to be tanned, and his leather to be made into shoes, and his wool to the stapler at a distance of 100, or 50, or even 20 miles, what would be the difference it would make in the intrinsic value of the two estates! What would be the cost in time, in labor and in manure, that one would have to pay or to lose over the other? Well, will not what applies in this way, to an individual farmer and his family, and his interests, apply to a whole nation of producers that have to send to foreign countries for what they want?—for a nation, after all, is but an aggregation of families. Free Trade would be very well, if all nations composed one Government, bound by a common interest, and its action had in view the welfare of the majority of the whole; but we must take the world as we find it, and as it is, no one of them can control another; and in this war of interests, the one that undertakes to play the liberal and magnanimous must expect to be sacrificed. The one that makes its agricultural prosperity depend on the arbitrary policy of foreign Governments, puts itself in the worst of all conditions—one of perpetual uncertainty and fluctuation, liable to have all its courses of industry disturbed by alien influences over which it has no control. There are countries so small, with climates and resources so limited, that they are compelled to rely on international exchanges. In that respect ours is essentially distinguished from others, for there is nothing except tea and coffee that we might not make, and these are not quite necessaries of life, and if they were we have enough to spare to give in exchange, on terms of mutual advantage.

Let it not be said that the causes which depress the Agriculture, and drive away the emigrants and the population from Maryland and Virginia, and the Southern States, are of universal prevalence and beyond the reach of cure: such is not the fact. The evil which does not, as most of it does, spring from defective national legislation, is of local and peculiar character, whatever it be. Look for a moment how it exhibits itself in States of the same age, and resembling each other in some of the principal features of their geographical position. Compare, for example, Maryland and Massachusetts, the two oldest sisters of the Republic—born about the same time, of the same parents, and pretty much the same education—with difference of religious training equal to that between tweedle-dum and tweedle-dee. They took a fair start; and now let us see how they get along in the race. Let us see whether one does not seem to have been in charge of some young greenhorn, just come upon the turf. The other under the instructions of "old Nap," Col. Johnson himself, with Archy Taylor for his trainer. Here they go, then. Maryland at the first jump spreads herself over 7,040,000 acres. Massachusetts, like little Trifle, covers, as she stands, but little over half as much ground—4,640,000 acres. Maryland mild in climate, scarcely any winter, soil easily worked, free from stone, and responding quickly to good treatment—Massachusetts naturally cold, hard, hilly, stony and sterile.

	Acres.	Population in 1790.	Population in 1840.	Increase in 20 years.
Maryland	7,040,000	319,728	470,019	62,691
Massachusetts	4,640,000	378,717	737,699	214,412

Maryland, on a basis of 407,350, in the year 1820, increased in twenty years but 62,669, of which 40,000 occurred in one city; while Massachusetts, on a basis of 523,287 in 1820, went up in the same twenty years, to 737,699; having increased 214,412—besides supplying Maryland very freely with school-masters and school-mistresses, and merchants and manufacturers.

Now bearing in mind, that in Maryland and Virginia, the vehement denunciations of banks and corporations of all sorts, make the ladder on which young political aspirants, (of whom the farmers are the hobby-horses,) mount first into the Legislatures, and then into Congress, and then into offices at home and missions abroad; bearing all this in mind, let us compare the policy and circumstances of the regions referred to, leaving you, reader, to judge how far free trade in money and facilities for establishing banks and factories, have had influence on the growth of population, and the cause of education; in a word, on the social improvement and political power of these old sister States respectively. In Massachusetts, be it remembered, the banks have never suspended specie payments. Yet there, and in Rhode Island, almost any dozen people in any village may form a Bank on complying with a few simple forms, and the people are left entirely free to deal with them in money, as they would deal in potatoes or onions. Hence, as we are well informed by a wealthy citizen of Massachusetts, well known in Baltimore, where he goes with his capital, to buy Maryland produce and sell Massachusetts manufactures, *any industrious, respectable man, can borrow money for any industrial enterprise* either from the banks or from individuals. Is it so *in the country* of Maryland or Virginia?

The men who direct the banks in New-England and lend the money, are like the borrowers—plain, industrious working-men. The shares of stocks are divided, in small amounts, among a great number of people. Almost every farmer has a share in a bank or factory, or a turnpike road, or a railroad—generally a little in all; and the amount given to a Cashier or President in Baltimore, including his house-rent, would pay all the expenses of conducting a Massachusetts or Rhode Island Bank. Now look at the difference of population and banks, and banking capital, in the four States. We only state the facts, and leave you—kind and discriminating readers—to draw the inference, and to see the connection between these things and the Agriculture of the four States—for now we will draw little Rhode Island and the Old Dominion into the lines of comparison.

	Area in Acres.	Population in 1820.	Population in 1840.	Number of Banks.	Bank Capital.	Employed in Agriculture.	Employed in other pursuits.
Maryland	7,040,000	407,350	470,019	23	8,901,000	72,946	29,041
Virginia	39,233,280	1,065,379	1,239,737	36	10,502,000	318,771	69,893
Massachusetts	4,640,000	523,287	737,699	109*	32,112,000	87,837	125,067
Rhode Island	768,000	83,059	108,830	62	11,023,000	16,617	25,156

Here it will be seen that even little Rhode Island, with her 100,000 inhabitants, and less than a million of acres of land, has double the number of banks, and the use of more capital, to give activity to her industry, than Virginia with her more than a million inhabitants *and near forty millions of acres, instead of less than one!* Nor, with all the denunciations fulminated against banks, and corporations of all sorts, do we hear of any failures of Banks in Rhode Island. Instead of general and sweeping condemnation against banks and corporations, by people who

* Large as was already the banking capital of Massachusetts, the addition of the present year (1848) is about two and a half millions.

have not always the clearest comprehension of what they are denouncing, their hostility should be directed against the *abuse* instead of the use of them; and that abuse is always in proportion to the perplexities and restrictions which overweening suspicion imposes on what should be free to regulate itself. The money power in some States, where there are few Banks and much difficulty in borrowing, is a monopoly engrossed and used by a few, to take advantage of the necessities of the many—and *especially the cultivators of the soil*. In New-England, the money power is distributed among the many, and used for the benefit of the enterprising and industrious of *all classes*. In Maryland and Virginia, banking capital is used, in vast proportion, by large merchants, and great speculators in the produce of the farmer and the planter. In thriving New-England it is owned by and loaned to the middling farmer, the mechanic, the gardener, the small manufacturer and shop-keeper—in a word, to industrious, prudent men, in all the walks of useful employment. Fortunately, that truly republican people are not made up of a few great men, with all around of pigmy stature. All are nearly of the same hight, few very rich or powerful, nor many poor and powerless. In Maryland, bank capital is loaned to nabobs by the $20,000, and they are thanked for taking it—while thousands of industrious men toil on in poverty through life, or are driven from the State for want of a few hundreds to start them in useful business. In Maryland, the monopoly of capital by a few gives them power over the producer and his produce; and over the mechanic and his genius, which would often bring independence if he had capital to put it in motion. In New-England, banks are numerous, stockholders more numerous, and the capital is loaned in small sums, to hosts of industrious people of all classes and denominations, whose name is legion. Hence universal activity and universal and nearly equal prosperity—but very few great men, and as few very little ones.

We should weary the reader were we to present all the remarkable points of contrast that have been produced in the condition of these two Middle and two Eastern States, by their different policy and legislation and ideas as to money and manufactures—for it cannot be alleged that Massachusetts and Rhode Island possess any natural advantages over their larger sisters in respect either of water-power, or materials, or resources mineral or agricultural—quite the contrary. But look for a moment how the result must bear upon the landed interest of these States respectively:

Massachusetts and Rhode Island united have invested in *Woolen* manufactures	$4,865,200
In *Cotton*	24,740,099
Total	$29,605,299
Virginia and Maryland: in *Woolens*	$229,980
In *Cotton*	2,603,480
Total	$2,833,460
Massachusetts and Rhode Island more than Maryland and Virginia	$26,832,839

Now who can fail to see the obvious effect upon the landed interest of these two sections? In the East, they consume at home all they can draw out of their land, and return to it, to sustain its fertility, not only the offal and manure of all they make, but they draw immense supplies, to be consumed on their land, from the Maryland and Virginia farmers, who send away everything and consume comparatively nothing—leaving their lands to recruit themselves or be worn out, as they inevitably must. The Maryland and Virginia farmers send their hides out of the State to be tanned: their wool out of the State to be woven; their beef to be eaten; their flour to be eaten; their corn to be eaten; while the Yankee tempts the weaver to come to the wool-grower, the tanner to

come where the hides are grown—all, in fact, whose labor is employed in factories producing $52,158,683, to go *there*, and eat his bread, and his meat, and his milk and butter, and cheese, and fruit—all on the spot. Everything is kept and consumed at home.*

What is wanting, as it seems to us, (despising the thought of speaking as a driveling partisan in this journal and on such a question) is, that the American people in *a body, and as with one voice*, should determine to break the colonial vassalage which elevates our Industry to-day and sinks it to-morrow, according to the accidental wants and vacillating polity and Tariffs of foreign Governments —especially that of England, who in ceasing to be our Mother has become our Step-Mother or Governess. In our vast extent, embracing every soil and climate, we may adopt an American policy, independent of the world, our States reciprocally supplying and demanding of each other all they want and all they can produce; and we can force the capital and the machinery now employed in the fabrication of the $100,000,000 that we buy abroad, to come and be employed here; or our own citizens, seeing their way secure, will occupy their place. Then would our people concentrate, instead of scattering; rich swamps and pocosons would be drained and brought under the spade and plow; and with dense population would come education, and power, and prosperity, and increase in the value of lands. We should first thicken on the seaboard, and gradually swell and spread around the circumference, as Nature spreads the forest, by natural expansion, and as she intended society to grow by a natural accretion and not by having its limbs torn off and its seeds scattered to distant and ungenial soils, by lightning, and storms, and monstrous disturbances, such as are constantly driving sons from fathers and daughters from mothers.

"The first and great desire of Man," says H. C. Carey, in that extraordinary and powerful work, 'The Past, the Present and the Future,' "is that of maintaining and improving his condition. With each step in the progress of concentration, his physical condition would improve, because he would cultivate more fertile lands, and obtain increased power over the treasures of the earth. His moral condition would improve, because he would have greater inducements to steady and regular labor; and the reward of good conduct would steadily increase. His intellectual condition would improve, because he would have more leisure for study, and more power to mix with his fellow men at home or abroad; to learn what they knew, and to see what they possessed; while the reward of talent would steadily increase, and that of mere brute wealth would steadily decline. His political condition would improve, because he would acquire an increased power over the application of his labor and of its proceeds. He would be less governed, better governed, and more cheaply governed: and all because more perfectly self-governed."

Heaven bear us witness that we find no pleasure in the contemplation of the picture of our native State which Truth tells us we must draw if we would sketch it with her pencil. Yet we must proceed to give it a few more touches, by way of filling-up.

The population of Baltimore in 1830 was 80,625; in 1840 it was 102,313. Deduct that increase from the total increase in the whole State during the same period, and there remain, to be divided among all the counties, in these ten years, only 1,299, or about 60 to a county; but so far from some of them having increased at all, nine out of twenty have actually *retrograded* within the 20 years prior to 1840; and this has happened as well on the Western as on the Eastern shore.

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* Annual produce of the manufacturing industry, by the Census 1845:

Of Massachusetts	$43,518 051	
Rhode Island	8,640 622	
		52,158 683
Virginia	8,349 218	
Maryland	6,212 677	
		14,561 895
Massachusetts and Rhode Island more by		$37,596 789

Those which have not held their own are: Caroline, Kent, Queen Anne, Somerset and Talbot (on the Eastern,) and Charles, Frederick, Montgomery and Prince George's. Frederick fell off probably not in fact, but because Carroll has been detached, and of that county there is in the statement before us (Darby's) no account. What surprises us is the diminution in Montgomery. How has been lost, there, the example of the Brookses and Stablers, and many others, exemplars of intelligent industry and sagacious management! Have they no water-power, or have they no capital to bring it into play, and is much lost on bad roads or otherwise in the work of exchange?

On the Eastern shore of Maryland, in the time above named,

Caroline	*lost* 2235	Worcester	*gained* 916
Kent	.. 611	Dorchester	.. 1088
Queen Anne	.. 2319	Cecil	.. 1184
Somerset	.. 71	Total	3188
Talbot	.. 1299	Gross loss	6535
Total	6535	Gain	3188
Net loss on the Eastern shore			3357

Now is not a state of things exhibited here, that imperiously demands the anxious investigation of every landholder?

But, farmers of Maryland! as we would rejoice to see you going ahead in all that constitutes strength and prosperity, excuse us for asking, Have you the men willing to go into public life, to whom you can assign the business of Legislation, and who are animated by a true and noble *American*, not party, spirit; and who, moreover, are educated up to the point of capacity *equal to such inquiries?*—men who have the self-command to lay aside party feelings and boldly follow the line of duty wherever it may lead? and, above all, ☞ Will you support them in so doing? Here, as you see, instead of a steady thickening of population, increase in the variety and quantity of your staples, and constant appreciation in the value of your lands, such as might naturally be expected from its locality, its natural fertility, and the ease—comparatively with New-England—with which it can be labored, you behold moneyed men with their capital turning their backs on you, and going away to the Western Frontier for investment, and your population diminishing! Such results cannot have come to pass without some powerful depressing incubus resting on your landed interest, arresting its development and melioration, and paralyzing your Industry—reminding one of the squab fiend described by Darwin, flitting "o'er fen and lake and bog," until he finds "some lone 'wildered maid with sleep oppressed," and there

> "On her fair bosom sits the demon ape
> Erect, and balances his bloated shape—
> Rolls in their marble orbs his Gorgon eyes,
> And drinks with leathern ears her tender cries."

What is that influence, and how is it to be removed? And is it not worthy of the consideration of all agricultural societies, and of all good men devoted to the prosperity of the landed interests? Nay, is it not a matter for investigation, quite as practical and as promising of good results, as would be an inquiry for the thousandth time, how much lime should be spread on an acre—and how big and fat *can* a bullock or a hog be made? Pardon the plainness and the freedom of such questions from one who, in prosperous as well as adverse times, has ever found his greatest pleasure, all his life, in earnest (however ineffectual) inquiries and exertions to assert your rights and to promote your welfare.

SHOULD THE LOOM COME TO THE COTTON, OR THE COTTON GO TO THE LOOM?

To the cotton-grower this is a question of the highest importance. His future prosperity depends on the correctness of the answer he shall make to it, and we desire, therefore, to offer for his consideration some views that may tend to enable him to answer it understandingly. The enlightened Editor of the New-Orleans Commercial Bulletin—in the center of light and interest on the subject—remarks:

"We buy, in New-Orleans, negro cotton goods manufactured from one bale of cotton, for about the same sum that we receive for five bales of raw cotton; the other four bales being for the labor and profits, which are divided between the ship-owner, Northern or English operatives, mill proprietors, agents, and commission merchants; all of which would be retained at home, for the benefit of our own citizens, had we cotton-mills established here."

Having bestowed some reflection on the above statement, we respectfully invite our readers to accompany us in an examination of the *nature of the exchanges* to which it refers.

The number of working hands engaged in the production of Cotton may, with some approximation to exactness, and near enough for our purposes, be set down at 800,000, and the average product per hand at 1,000 pounds, giving as the total product 800,000,000. Each hand, however, is supposed to cultivate about as much land in grain as in cotton.* The labor employed in the production of cotton is therefore equivalent to that of 400,000 persons, and the product is the equivalent of 2,000 pounds, or five bales, to the hand.

A cotton factory containing 250 operatives, one-fourth only of whom are males, will convert 2,000 bales of cotton into cloth. This gives 8 bales per hand. Five persons in a mill will therefore convert into cloth as much cotton as eight will produce; and of these five, three-fourths are females quite too young and feeble for efficient field labor. A fair estimate of the quantity of power needed for manufacturing and producing, would give to the work of production more than twice as much as is required for that of conversion or manufacture; but we will assume that five persons are required for the manufacture of that which is produced by eight.

The labor of production is as valuable as that of conversion, and a just distribution of the proceeds, would give to the planter eight parts out of thirteen, leaving the remaining five for the persons employed in converting the cotton into cloth. We see, however, that the planter gives five bales for one, or a hundred for twenty; whereas if the distribution were in the just ratio of the labor employed, the planter should have sixty and the manufacturer forty.

This is, we believe, less than the true and just distribution would give to the planter; but to avoid the possibility of error, we will assume that the product should be equally divided between the producer of the cotton and the parties by whom it is converted into cloth. Two bales of raw cotton should then pay for one bale when manufactured; yet here we see, on the authority of the Editor

* See Southern Quarterly Review for January, 1848, page 120.

of the N. O. Commercial Bulletin, that the planter has to give five for one. What then becomes of his remaining three? Assuredly no planter should rest satisfied until he can answer this question, to the end that as far as practicable he should escape from so heavy a tax. To answer the question, let us endeavor to trace the course of operation to which the five bales of cotton are subjected from the time of leaving the plantation until they are returned in the shape of one bale converted into cloth. First, we have the transportation to the place of shipment, in which a part is swallowed up.* Next comes commission to agents in New-Orleans or Charleston. After this comes transportation to England, or to New-York or Boston on its way to Lowell or Manchester. Next, commissions in New-York, Boston, Liverpool, and Manchester. Next come wages to operatives and profits to master-manufacturers. Following this, we have transportation from Lowell or Manchester, and thence to New-Orleans, with an endless train of charges and commissions, the result of all which is, that the planter gets back *one* bale for five, when he should have, by a just distribution of profits in proportion to labor, *almost three*. He gives five for one instead of two for one (the real, naked difference between producing and converting, making a most liberal allowance for the latter,) and the other three are irrecoverably lost to him.

Let us now inquire of what all these charges consist, and we shall find that they resolve themselves almost altogether into the single article of *food*, the only others being a small amount of clothing and lodging. The cart and the wagon are composed chiefly of the food eaten by the men who made them. The road by which they travel in conveying the cotton to the place of shipment is composed of, or chiefly based upon, the food of the men who made it. The steamboats by which it is conveyed to New-Orleans represent the food of the men who built them, of those who navigate them, and of those who provide the fuel. The commissions represent the food of the men who sell the cotton, of the servants who wait upon them, of the men who build houses for them to live in, and carriages for them to ride in. The packet-ship represents the food of the men who felled and sawed the timber, and of those who transported it; of the men who dug and smelted the ore and fashioned the iron used in her construction, and the carpenters and workmen by whom it was put together. The work of twisting, and weaving, and finishing, represents the food of the twisters, and weavers, and finishers. If now we inquire what proportion the latter bears to the whole quantity, we shall find that it is far less than one-fourth of the whole. We will, however, assume that it is one-fourth, and then show what becomes of the other three bales that the planter pays for one of manufactured cotton.

Debtor.	*Creditor.*
To five bales of cotton.	By *one* bale cotton twisted, woven and finished. By *one* bale given for the food of the persons who twisted, and wove, and finished it. By *three* bales given for the food of the persons intermediately employed in carrying it to the twister and weaver, and bringing back to the planter the one bale twisted and woven ready for use.

* Of the expense of this first movement some idea may be formed by those who have seen it coming over dreadful roads, up to the hub, dragged slowly along, 20, 30, or 40 miles, as we have seen it coming into Natchez and Vicksburg, hauled by five yoke of oxen carrying 2,800 to 3,000 pounds, and so slowly that motion was scarcely perceptible. So many perish in the yoke in winter and spring that it has been said, with some exaggeration, that you might walk on dead oxen from Jackson to Vicksburg. That was before the railroad was made. A wagon is loaded up, say 14 miles from Natchez, and started at night, and reaches there in time to get back the next night time enough to "load up." Thus ten oxen have been wearing and tearing and dropping their manure on the road for 24 hours to make one load.

This would seem to be a bad bargain. The planter will perhaps say, however, that we have allowed nothing for the use of the machinery employed in the conversion. True, we have not. Neither have we charged anything for the use of the machinery of production. Let us now see how that matter stands:

The average production of cotton does not exceed 300 pounds of clean wool to the acre. To produce two thousand bales would require, then, nearly twenty-seven hundred acres, actually under cultivation, to say nothing of all the rest of the plantation not in cultivation. The average amount of labor, per acre, for fitting these lands for production, including fencing, machinery, buildings, gin-houses, &c., is at least one hundred days, and we should be safe in putting it much higher.* This would give 270,000 days of labor. A mill that will convert these two thousand bales into cloth, does not represent more than 70,000 days of labor. The machinery of production is therefore more costly than that of conversion, in the ratio of four to one.

Under this head, then, the account will now stand thus:

Dr.		*Cr.*	
To machinery for producing four bales of cotton	16	By machinery for converting one bale of cotton	1

The transaction appears to be a very unprofitable one. The planter is giving five bales of cotton, produced by the aid of very costly machinery, for one bale converted into cloth by aid of comparatively inexpensive machinery. He gives four bales for doing that which, if the machinery were on or near his plantation, might be done for less than one bale.

In the performance of this operation, he is always in fact, as we have seen, buying food and paying for it with cotton. He is always paying for it in distant markets, where its price is high, while he or his countrymen are perpetually engaged in the effort to sell it at low prices at home. In getting his yard of cloth he pays for food consumed in the steamboat—in New-Orleans—on shipboard—in Liverpool and Manchester, at which latter place it is probably four times higher than that at which he would gladly sell on his plantation, and he wastes a vast quantity because of the want of a market near him, and the heavy cost incident to its transportation to distant markets.

One acre of land yields 300 pounds of cotton. One hand in a mill converts 8 bales, or 3,200 pounds, the produce of more than ten acres.

An acre of land, well cultivated, will supply food for one person who will convert these eight bales into cloth.

The planter gives four bales for having one converted, or eight for the conversion of two, according to the testimony of an enlightened journalist residing in the heart of the cotton region, and speaking under the benefit of the best lights on the subject.

Let us now see how the account stands again:

Dr.	*Cr.*
To the use of five acres of cotton land.	By the use of one-eighth of an acre of food land.

It is obvious that nearly the whole of these bales are swallowed up in freights, charges, commissions, &c., and equally obvious that these charges consist almost altogether of food, an article which the planter can supply in almost unlimited quantity. Could these charges, occurring between the planter on the one side and the weaver and the twister on the other, be saved, the planter would obtain more than one bale of cloth for two of cotton. To accomplish this there is but

* B. Smith, Esq, one of the wealthiest planters in the South-west, told us that it cost him $70 an acre to *clear and prepare* heavy-timbered land for cotton on the Mississippi bottom.

one mode of proceeding, and that is to persuade (by taking measures to make it the interest of its owners) the *machinery to come to the cotton*, and thus obviate the necessity for sending the cotton to the machinery. At present we seem to be pursuing the same course that would be pursued by the man who should expend hundreds of thousands of days of labor in clearing and cultivating land for the production of wheat, and then wasting two-thirds of it on the road to and from the distant mill, for want of the application of three or four thousand days of labor to put up a mill on his own land. A grist-mill costing 5,000 days of labor will grind all the grain produced upon land that has cost 200,000, and perhaps 500,000 days of labor to place it in its existing condition; and yet the man above referred to, with such a force and plantation, wastes more days annually than would build such an one. So is it with our planters and farmers. We see in every little community that mills speedily rise for the conversion of grain into flour, and are satisfied with one-eighth toll; and so we see in every neighborhood, where there are timber and a little water-power, saw-mills are got up for converting lumber into boards; and with each such operation, flour and boards are obtained at less cost of labor, and the farmer has to give less of wheat, and of timber, to have them converted into flour and boards. What would the wheat-grower say who should have to give five bushels for getting one back in flour*--and what should the cotton-grower say to getting back one bale of cotton in the form of cloth? Let him reflect on this, and then answer the following one: Why should not every community of somewhat larger size have in like manner its own place for converting cotton into cloth? Could that be done, the planter would obtain half the cloth yielded by his cotton.

The latter will at first view probably deny this. He will say: If I sell my cotton to go to Manchester, it will produce me five cents. If I sell it to the manufacturer on the ground, he will give me no more. If I buy English cloth, it will cost me ten. If I had a manufacturer on the ground, I should pay the same. So he might for a time; but the manufacturer would make large profits, and competition would speedily arise, and then he would have his cloth on the ground as cheaply as he could buy it in Lowell, and here would be one saving. This, however, is not all. Let the planter look around and see how much of the labor of his neighborhood is wasted for want of the demand that would be produced by the vicinity of the factory. Then let him reflect upon the advantage to be derived from having, in that factory, a place of employment throughout the year, of the persons who might, in case of need, aid him in his picking, and thus save for him the labor that is now lost on cotton wasted in the field, or overtaken there by frost. Let him consider these things, and he will probably find that the loss in them alone is equal to the value of the labor required for the conversion of all the cotton of the neighborhood into yarn. If they could be saved, and he could thus, with the same labor, send yarn to market instead of cotton, he and his neighbors would be great gainers by the operation.

Having done this, let him look to the price at which he sells his corn and see what would be the difference to him if he had a market on the ground in consequence of the conversion of some of his neighbors into mechanics, mill operatives, &c. Instead of remaining poor on the produce of little pieces of land,

* In some places in Virginia—in Rappahannock, for instance—the farmer does pay as much as one barrel to get four transported to Fredericksburgh, apparently not stopping to calculate at what price and what yield per acre that becomes a losing game, and apparently not reflecting that while they pay 25 cents for transporting one dollar's worth of *wheat* they could transport the same weight, or fifteen dollars' worth of wool—or $7 50 of cheese, or $18 worth of live beef—at the same cost!

they would obtain good wages, and consume double their present quantity, while producing none. He would at once save much of the cost of transportation. He would sell food at home instead of having to buy it, with cost of commissions and transportation from his own neighborhood added to it to increase its price at Manchester or Lowell, and all would be a great gainer by the operation.

Let him then look to his cleared land, and study what would be its value if all the manure yielded by his hay, and oats, and corn, and fodder, went back upon the land, instead of being wasted on the road, and if all of that yielded by his wheat and corn remained upon the ground instead of going to Lowell or Manchester, and see if he would not be a gainer by the operation.

Let him then look to his uncleared land, and calculate how much it would cost him to destroy the timber.* Let him then calculate the value of the timber, if the factory were near him, and if the blacksmith and the shoemaker, the hatter and the tanner, the bricklayer and the carpenter, wanted houses; and if a town were growing up around the mill, and its inhabitants wanting pork and meal, and milk and beef, and flour, and potatoes, and mutton, and see if he would not be a gainer by the operation.

Let him look to the quantity of land upon which this timber stands, and on which he is paying or losing interest. Let him then look to the quality of that land, and compare it with what he now cultivates. Let him calculate how many bushels of potatoes it would yield, and compare their value, when consumed upon the ground, with that of the 300 pounds of cotton now yielded by an acre, and see if he would not be a gainer by the operation.

Let him add all these things together and see if he would not save all the freights and commissions; even although he obtained no more for his cotton, and paid as much for his cloth. Let him see if he would not obtain the full value of his cotton, instead of, as now, obtaining but one-third of it.

The truth is, that the great cities and towns of the world are built up out of the spoils of the farmer and planter. Looking around here in New-York, or in Philadelphia, or Boston, it is not possible to avoid being struck with the number of persons who live by merely exchanging—passing from the producer to the consumer,—producing nothing themselves. Wagons and wagoners, carts and cartmen, boats and boatmen, ships and sailors, are everywhere carrying about cotton, and wool, and corn, and wheat, and flour, as if for the pleasure of doing it. The man of Tennessee sends his cotton to Manchester to be twisted. His corn goes along with it to feed the man who twists it. It leaves him worth twenty cents. By the time it is consumed by the Manchester spinner, it is worth, perhaps, a dollar. The laborer buys it at that price. The manufacturer gives him a dollar to pay for it, and he charges it to the cloth at $1 10. The corn and cotton become cloth, and the Tennessee man buys it back, paying —as we see by a New-Orleans paper—*five bales for one!* He can sometimes send his corn, but he can never send his potatoes, and the reason why he cannot is, that they are of the class of commodities of which the earth yields so largely that they will not pay freight. The only things he can raise for market are those of which the earth yields little, and that will therefore pay freight. He raises three hundred pounds of cotton, all which goes to market, bringing him back but sixty fashioned into cloth; returning nothing to the land of what it drew

* A planter of the highest respectability, informed us at Montgomery, that he had in vain offered $20 an acre to have 200 acres cleared for cotton. Why don't the planters of Montgomery unite to build a steam factory.

out of the land, whereas if he had consumers near him, he would raise almost as many bushels of potatoes, the manure for which would go upon the land to enrich it, and make himself rich. He could then afford to clear, and ditch, and drain, and cultivate the richest land, now covered with timber, or with water.

Why does he not do these things? Why does he not bring the consumer to his side? Why does he continue year after year, to send his grain, or cotton, to the distant mill, instead of bring once and forever, the mill to him? The reason may be found in the newspapers every day. Last year cotton manufacturers, wool manufacturers, and iron manufacturers were prosperous. Now they are stopping their work. Many are already ruined, and many more are likely so to be. Why is this? Does it arise out of any change in our own affairs? It does not. It arises out of changes abroad. Last year England made railroads, and consumption then was large. This year she does not make roads, and consumption is small. Last year we built factories and furnaces. This year manufacturers and furnace-builders are ruined. All of them would be ruined, had they not a Tariff of protection, inadequate as is that of 1846 to give them that protection that is needed to secure them against such changes. Prosperous they would now be had the Tariff of 1842 remained unaltered; and the thousands employed in them would have remained profitable customers for the farmers, instead of being driven over the country to become the rivals of the farmer, increasing the quantity of provisions of which there is already a redundance.

We may now readily see why the planter of South Carolina and Georgia, and Tennessee, has not the consumer near him: why he continues year after year, wasting his cotton and his corn on the road going to the mill, instead of bringing the mill to him. The whole system of trade, by which the cotton and the food are thus forced to go to the mill instead of the mill coming to them, is unsound and unnatural, and therefore irregular, unstable, and ruinous. Revulsions are and must be perpetual occurrences; and none can risk their means in factories or furnaces, but men who can afford to incur great risks for sake of exorbitant profits. The whole system is one of mere gambling, and so will it continue to be while the trade of the country remains thus liable to be deranged by changes in the action of foreign nations, over which we can have no control; and so long will the planter continue to give five bales of cotton for one of cloth. Whenever he shall determine to take for himself the protection necessary to enable him to bring the spinner and the weaver to his side, there to eat the corn, while converting the cotton into cloth, he will save all the vast expense of transportation to which he is now subjected: he will increase the market for his cotton at home, and he will obtain better prices for the cotton and the corn that he sends into the general market of the world. All this he will do when he shall have arrived at the conclusion that the question of protection, is in fact and in truth, one of *protection to the farmer and planter*, and not of protection to the manufacturer. The latter with his machinery can go where he will. The planter's land cannot change its place. The former will come to him, as the grist-miller does, all over the country, if he can be assured of adequate and uniform remuneration, and the freight and commissions will then be saved. If the manufacturer cannot safely do this: if he continue to be, as in past times he has been, forbidden by the fear of change in parties and party policy, he will continue to compel the planters' produce to come to him, and commissions and freights will continue expensive and wasteful as now they are.

Let the planter examine carefully the changes that have occurred in the

prices of cotton in the last twenty years, and see if they have not been produced by the perpetual revulsions of England. Let him look around him now, and see if the change under which he now suffers is not due to the fact that he employs for the sale of his great product, *a broker that become bankrupt every four or five years.* Throughout the world there exists at this moment a greater power of consumption than existed twelve months since; and yet cotton has fallen to little more than half, and that for no reason but that English banks and bankers, English manufacturers and merchants, have become bankrupt. Why should the American planter be longer dependent on them? All the cloth made out of our cotton will be wanted and used whether manufactured here or there, and will need as many consumers to be employed in the work of conversion. Why then should we not bring the machinery of conversion to the side of the wool and the cotton, instead of sending the wool and cotton three thousand miles to the mill, and thus abolish, forever, the necessity of depending upon this great broker, who fails so frequently. "Nothing," to use the words of the South Carolina Committee, on the scheme for reducing the quantity of cotton, "can have more disastrous effects upon planters, than this fluctuation from low prices to high and from high to low. All which is necessary" as they say in continuation, "to our prosperity is a diminution in our wants, and a near approach to certainty in the market value of cotton."

Such is the want of the whole country, The manufacturer wants some certainty, and therefore does he ask for protection against the endless and enormous fluctuations of England. The iron-master wants some certainty, that he will not be ruined by those fluctuations. The farmer wants some certainty, that the furnace or the mill in his neighborhood shall not be closed by the fluctuations of English policy. The cotton planter wants certainty. None can have it while England shall be continue the broker of the whole cotton and wool-growing world. Let the farmer and the planter unite, not on party, but on *American* ground, to bring the consumers, with their capital and machines at their sides, and protect them when there; and thus they will *protect themselves*, and all will have certainty.

By the following extracts, for which we are indebted to De Bow's Commercial Review, it will be seen that Georgia and Tennessee are both going ahead in the important matter of bringing the consumer to the side of the producer. What is to be the effect of the present revulsion in England on their infant manufactures, remains yet to be seen. The great factories at Lowell, admirably as they are managed, make no dividends. The great establishment at Fall River, the first in the Union for printing cloths, is ruined. Large establishments elsewhere have failed, and more are likely to fail, and we have our fears for those at the South. The natural consequence of this must be that no new factories will be built for some time, and thus the planter has his market at home diminished at the very moment when from the failure of his great broker abroad, and the consequent difficulty of selling his cotton, he has most reason to desire to see it increased, and so it must continue to be until he shall determine to take for himself such effectual protection as will enable him to entice the little and inexpensive loom to come and take its place by the side of the great and costly machine of production.

Resources of Georgia.—Manufactures, &c.—Mr. Nisbit, whose able article on Georgia in the Southern Review, elicited so much applause—has lately made a report as Chairman of the Committee on Manufactures, in that State, from which we extract:

Georgia presents the greatest possible advantage as a manufacturing State. She has a large amount of unemployed capital and labor. She boasts a climate favorable for every kind of

enterprise and exertion. And then she occupies a geographical position which gives her ready access to the markets of the world, with her manufactured products.

But a few years have elapsed since the introduction of manufacturing into Georgia. Those few years have witnessed the initiative policy, its rapid advance, and its triumphant success. We have in successful operation several iron establishments, with large capitals and giving employment to some hundreds of operatives. These establishments are furnishing iron-ware of various kinds, cheap in price, respectable in quantity, and unexcelled in quality. They are also preparing to supply iron for machinery, agricultural implements, railroads, and all the uses of life. In the department of cotton manufacturing, your Committee have collected a few statistics, which they do not present as accurate, but approximating thereto. We know of thirty-two cotton factories in our State, in operation, or in progress of construction. There are employed in the buildings and working of these thirty-two factories, two millions of dollars. The number of hands engaged therein is near three thousand, and of persons directly receiving their support from the same, six thousand. The consumption of provisions and agricultural products (other than cotton) by these factories, is fully equal to three hundred thousand dollars per annum, at present prices. Their consumption of cotton per annum reaches 18,000 to 20,000 bags, and the value of manufactured goods turned out by them last year, fell nothing short of one and a half million of dollars. One-third of these manufactured goods were sold out of the State, mostly in the Northern markets, and partially in the Valley of the Mississippi—that illimitable field of consumption which lies open to the enterprise of our manufacturers.

Manufactures in Georgia and Tennessee.—Georgia and Tennessee are destined to become the great manufacturing States of the South, if not of the Union, because they have not only greater resources in proportion to their population, but, being traversed in every direction by railroads and rivers, and having a double outlet, both to the Gulf and the Atlantic, they will possess unparalleled advantages in regard to both the foreign and domestic markets. If our people would display one-half the energy and enterprise of the Yankees, in a quarter of a century from the present time we could surpass the whole of New-England in wealth and population: indeed all that we now lack to develop that enterprise and energy is the establishment of manufactories, and the more general introduction of machinery.

Let us compare for a moment the agricultural wealth of the two States named with that of New-England. Georgia and Tennessee have together a population of 1,694,000; the States of Maine, New-Hampshire, Massachusetts, Vermont, Connecticut and Rhode Island have 2,422,000 souls. Now let us see the relative products of the two sections as developed by the Census of 1840, and by more recent statistics:

	New-England.	Georgia and Tennessee.
Corn	11,943,000 bushels.	83,584,000 bushels.
Wheat	2,898,000 ..	9,911,000 ..
Potatoes	20,581,000 ..	3,792,000 ..
Rye	2,582,000 ..	448,000 ..
Oats	11,247,000 ..	9,458,000 ..
Buckwheat	1,097,000 ..	
Total	50,348,000	107,194,000

From the same journal we take the following comparative view of South Carolina and Rhode Island:

Manufactures for the South—Rhode Island and South Carolina.—One great cause of the unproductiveness of our capital and labor is the want of diversion of them. In every country there is a kind of labor which experience proves to be the best and most productive of that country. In one, Agriculture should predominate; in another, Manufactures; in a third, Commerce; but in no one on the face of the globe has an exclusive attention to either of these branches been found the most profitable. It is the judicious combination of them all that makes a nation great, and prosperous, and happy. This is an old political doctrine; its antiquity, however, is no disparagement of its truth. For its illustration we shall go no farther than the history of our own country. And fortunately for our purpose, the last Census of the Government furnishes data upon which there can be no dispute.

If we divide the population of Rhode Island (133,830) and that of South Carolina (549,398) into their respective annual incomes, viz., into $13,001,223 for Rhode Island, and into $27,173,536 for South Carolina, it will be perceived that Rhode Island divides, as the yearly income of each of its inhabitants, $100, while South Carolina divides only $45. If you take out the black population in both States, and make the division only among the whites, Rhode Island will divide $119, while South Carolina will divide $101. These are startling facts. Why are they so? It will, perhaps, be said it is either because the people of Rhode Island are more industrious than our people, or are engaged in more profitable labor; or from both causes combined.

The first of these we are unwilling to grant. Naturally we believe there are no people more willing to work than ours, when only taught to see a profitable result to their labor.

The difference in the profits of the two States must be attributed, therefore, to some other cause. The labor of Rhode Island is diversified, ours is not. Let us see: there are engaged in

RHODE ISLAND.		SOUTH CAROLINA.	
Agriculture	1 in 6	Agriculture	1 in 3
Commerce	1 in 87	Commerce	1 in 301
Manufactures	1 in 5	Manufactures	1 in 57

Divide the population of the two States into families of five each: there will be 27,766 families in Rhode Island and 113,879 in South Carolina. Give to each family, and to the horses, cattle, hogs, and sheep attached to each, the amount of grain, potatoes and hay usually consumed by them, and it will appear that South Carolina will be deficient in a self-supply as much as a million and a half bushels, while Rhode Island will have a surplus of very nearly that amount. This arises from the fact that South Carolina has more horses and cattle to support than Rhode Island. Thus, they are in

RHODE ISLAND.	SOUTH CAROLINA.
½ a horse to a family of five.	1½ horse to a family of five.
1 cow	4 neat cattle .. ..
4 sheep	1 sheep .. ..
1 hog	7½ hogs .. ..
6½ of all kinds.	14 of all kinds.

Suppose them to be equal, and that both States have enough of wheat, rye, oats, barley, potatoes and hay to support their population and cattle, and the comparative incomes of the two States would stand thus:

	RHODE ISLAND.	SOUTH CAROLINA.
Manufactures	$8,640,526	$2,248,915
Commerce	1,294,957	2,632,421
Mines	162,410	187,608
Forests	44,610	549,626
Fisheries	659,312	1,275
Rice		1,514,772
Cotton		4,628,270
Total	$10,801,914	$11,762,986

From this estimate each inhabitant in Rhode Island, after feeding himself, will have over $99 for clothing and other expenses, while each one in South Carolina will have a fraction under $20.

The above Table also shows another fact of much importance. The manufactures of Rhode Island are more valuable than the cotton and rice of Carolina taken together. In other words, the labor employed in the one is more productive than in the other two.

It is a question, then, which comes directly home to us, "Is South Carolina less capable than Rhode Island of excelling in the same profitable labors?"

We have already combated that class of complainers who are eternally decrying the profits of agricultural labor; there is another class who elevate it too much—even to the exclusion of all other pursuits. Nothing is easier than to be so deceived. Such persons view the agricultural calling with a poetical eye and see in it nothing but pastoral beauty and happiness. Were this the occasion, no task would be more pleasant than to indulge in drawing a picture of the virtue, and excellence, and riches of a people thus engaged. As a rhetorical exercise it might afford entertainment; but the true economist, criticising the work, would pronounce it only a fancy picture, alike untrue to nature and to fact.

Besides this, the introduction of different manufactures among us would have an effect not less important to our Agriculture—we mean the great inland trade it would create. In every prosperous country the inland or indirect trade is far greater than its foreign or direct trade. In England or New-York, for instance, it is fifteen times greater. Consider, then, a new trade created for Carolina ten times greater than at present; consider for a moment the influence upon Agriculture—how much more certainty it would afford the merchant in the investment of his capital than in foreign risks; what a numerous class of workmen it would employ; the misery it would remove by giving business to the idle, and the content and happiness it would afford the complaining. Is not such a consummation devoutly to be wished for? [South Carolinian.

Such a consummation *is* most devoutly to be wished, but how is it to be obtained?

Of all the cotton-growing States, South Carolina is the one whose planters most need protection, because they are nearest to the great cause of disturbance. The manufacturer of Tennessee is protected by distance. He buys his cotton cheaper, and he can sell his cloth dearer, because of the difference of freight, and therefore it is possible that he may be enabled to go on, notwithstanding the oc-

currence of these unceasing and enormous revulsions. The manufacturer of South Carolina is not so protected, and the danger of ruin to those who may engage in converting the food and the cotton of that State into cloth, and thus diminishing the cost of the conversion, is immense. Of all the States of the South, this is the one that is best situated for manufacturing. She has more wealth at command than any other. Her citizens have always been large stockholders in *distant banks*, because at home the State was the great banker. By regulation she has thus driven abroad the wealth that should have been retained at home, and her citizens are now flying from poor lands that they have exhausted, leaving behind them the richest lands of the State untouched. Marl and limestone, the proper application of which would render her one of the richest States of the Union, abound throughout the State, yet men fly to Arkansas and Texas, abandoning their houses, their relatives, and their friends, because they cannot find near those homes a demand for the food that they could raise in such vast abundance on her rich and untouched soils.

South Carolina is the State that *of all others* most needs protection. It is the one that would, of all others, most profit by it. It is, nevertheless, the one, of all others, whose planters are most determined not to take for themselves that protection which would make her the Rhode Island of the South, and enable her to maintain that position in the Union which she is now so rapidly losing because of her increasing tendency to depopulation. The day cannot, we think, be far distant when she will open her eyes to the error of her policy.

Much as this article has been extended, the subject growing in interest as we contemplate it, we cannot close it without making the following brief extracts from Mr. Carey's remarkable and convincing work, "The Past, the Present, and the Future," to which we have elsewhere referred, and which every friend of Agriculture and the *real independence* of his country ought carefully to read:

What is the extent of indirect taxation upon the people of the United States by means of the system which keeps the producer and the consumer widely separated, may perhaps be estimated if we take into consideration the following facts:

1st. The labor annually expended in the construction of carts, and wagons, and ships, that would be unnecessary if the consumer and producer could be permitted to take their place by the side of each other, would produce as many mills and furnaces as would convert into cloth half the cotton and wool produced, and smelt the ore for making all the iron used in the Union. To the carts, and wagons, and ships, may be added the labor of horses and oxen and mules employed in the same wasteful work.

2d. The time lost by the persons employed in the work of unnecessary transportation and exchange; by those who are idle in whole or in part for want of a regular demand for labor; and by those who are on the road seeking for new places of residence; is more than would be required for the work of converting all the wool into cloth, and all the ore into iron.

3d. The labor that is now given to the work of cultivating poor soils yielding ten bushels to the acre, instead of rich ones that are capable of affording tons of food by aid of which poor soils might be enriched, would yield double the return could the consumer take his place by the side of the producer and thus save the manure that is now wasted.

4th. The labor that is now wasted in making and repairing roads through new States and Territories, and among scattered settlements in both old and new States, if applied to the improvement of old roads, would diminish annually, and largely, the cost of transportation of the products of those portions of the earth requiring to be exchanged.

It may safely be asserted that the labor of Man, as now applied, is, on an average, but half as productive as it would be were it possible for the consumer and the producer to be near neighbors to each other, and if so, it follows that the indirect taxation by aid of the colonial system is equal to the whole of the present product of the Union, which we have estimated at two thousand millions of dollars. If we wish evidence of the extent to which taxation is pushed by aid of this system, we need only to look to all the colonies of England throughout the world, Ireland, India, the West Indies, Canada, Nova Scotia, and South Africa, and we shall find exhaustion and depopulation universal, as it must continue to be wherever the power of self-protection has no existence.

NIAGARA FALLS SUSPENSION BRIDGE.

It is probably known to most of our readers who take an interest in such matters, that the Canada people have under contract and now in the course of construction, a railway, which is intended for high speed and heavy freight, from Windsor on the East shore of Detroit River, about a mile below the Falls. The distance is 228 miles.

From the eastern shore of Niagra, opposite the terminus of the Canada Railway, a railway through Lockport along the Erie Canal to Rochester, is in the course of construction. Both of these roads, it is said, will soon be finished. They are, however, separated by the mighty Niagara, which runs between them in a gorge more than two hundred feet deep, with nearly perpendicular banks, and its waters are entirely impassable, owing to rapids tumbling over a rocky bottom on a great descent through which no water-craft ever attempted to cross.

To remedy this difficulty, some enterprising gentlemen of Western New-York, and Canada, have set themselves about spanning the river from railroad to railroad with a bridge, to be suspended on wire cables, of sufficient strength to cross railroad trains, as well as carriages and horses, and the work is already under way, under the superintendence of Charles Ellet, Jr., Engineer. To effect this, they are erecting two towers on each side of the river, built of substantial masonry, about sixty feet high above the rocky banks. Over the tops of these towers sixteen wire cables, four inches in diameter each, are to be stretched and anchored into the rock and fastened in the rear of the towers. These cables will weigh twenty-seven tons each, and will possess a strength equal to the support of six thousand five hundred tons weight.

From these cables thus extending across the river, the floor of the bridge is to be suspended on a level with the brow of the banks; and cars, carriages and passengers will enter upon the floor of the bridge between the towers. There will be two footways on the bridge, of four feet width each; two carriage-ways of 7½ feet each, and a railroad track.

The floor of the bridge will be two hundred and thirty feet above the water, and in full view of the Falls above and the whirlpool below, and the bed of the river between; thus adding artificial sublimity to Nature's grandeur, and making each contribute to the other. The expense of this bridge will be about two hundred thousand dollars, and the grandeur of the work, and the attractions it will present at this great resort of the curious and the fashionable, would seem to form sufficient inducement for the outlay.

But such was not the inducement. The gentlemen who have undertaken it—like most of our enterprising countrymen—are practical and utilitarian. Lakes Erie and Ontario are about thirty-six miles apart—joined by the noble Niagara, passable any time at only a few points, and sometimes passable nowhere between the two lakes on account of floating ice. On both sides of the river is a thick population of Anglo-Saxons, carrying on constant intercourse. To facilitate this, and annex the two countries, and join their railways, they have set themselves to erecting this stupendous and seemingly impracticable structure. Western New-York desires to avail herself of the transit of the Canada trade

through the State and take its advantages. Canada is desirous of giving the Western States a passage through her dominions and to avail herself of whatever advantages may be gained by it.

Michigan, Illinois and Wisconsin desire a winter trade, and are restless at being locked up so many months in the year by ice from the Atlantic, and they desire also to have a shorter, quicker, and safer passage to the East than round through Lake Erie. And the farmers in Canada and the interior of the upper States are anxious to send down their produce, and would not like to be stopped by this impassable gorge in the river. Our readers will therefore see that the public interest of vast multitudes is very deeply concerned in this enterprise, and though presenting great inducements to the curious and fanciful, it is, nevertheless, a work of vast utility, in which the benefit of millions is concerned.

The prime mover of this magnificent display of civil engineering and combination of mechanical powers, is our worthy fellow-citizen Lot Clark, Esq., heretofore distinguished in the public annals of his country; but certain now to be more widely and longer known by this momentous enterprise.

This suspension bridge seems worthy to stand in view of that stupendous display of the grandeur of Nature, the Falls of Niagara; the sight of which so well rewards the pilgrims who come annually from all quarters of the world to contemplate and admire it.

No reader of good sense—and we trust we have none others—will need to be reminded of the inseparable connection which everywhere exists between the *Agriculture* of a country, and its *roads and bridges*, which serve—according as they are more or less perfect—to facilitate and cheapen transportation and exchanges between rural and manufacturing industry.

Experiments on Depths of Sowing.—October, 23; Planted, at 3 inches distance, 16 seeds of Wheat, taken from one fine ear. Two were deposited at exactly 1 inch deep; two at 2 inches deep; two at 3 inches deep; two at 4 inches deep; two at 5 inches deep; two at 6 inches deep; two at 7 inches deep; and two at 8 inches deep. The land was in good heart, and finely pulverized or meliorated 1 foot deep, on purpose for the experiment; the situation facing the south, and in the middle of an open field. At harvest the result was as follows, viz: Those deposited at 1 inch deep were almost turned out of the ground, had tillered very little, and the ears were few, and the grain lean. Ditto deposited at 2 inches, tillered largely, and stood upright on the ground, were well filled, and excellent grain. Ditto deposited at 3 inches deep, tillered more largely, and had stronger straw and larger ears, ripened well and seasonably. Ditto deposited at 4 inches, nearly the same. Ditto deposited at 5 inches, did not tiller so much as those deposited at 4 inches, neither did they produce such strong stalks, nor so much grain. Ditto deposited at 6 inches deep, tillered less, and did not ripen so well as the above. Ditto deposited at 7, produced only one stalk; it shriveled to nothing before midsummer. Ditto deposited at 8 inches deep, never came above ground. The result of this experiment, and a variety of others, made at different times on different seeds, and in different soils, the particulars of which I shall not here trouble you with, give me reason to conclude that from 2 inches deep to 5 is the greatest latitude which this operation admits of. The lightest soils and driest seasons require the greatest depths to be used; and wheat, of all the grains, admits of being deposited deepest. When the soil has been lately broken up, and rich, or is a very fine sandy loam, &c. full of manure (and withal a dry seed-time), I have found 4 inches the best depth; but in general, 3 inches, in my experiments, has answered best. [Clarke's Theory of Husbandry, 1781.

Keeping Beef Fresh.—Combe says the ribs will keep longest, or five or six days in summer, the middle of the loin next, the rump next, the round next, and the brisket the worst, which will not keep longer than three days in summer.

LETTER XV.

ANATOMY OF THE SHEEP (Continued)—DISEASES AND THEIR TREATMENT.

The Thoracic Viscera...The Diaphragm...The Thorax...The Heart, Arteries, Capillaries, and Veins...The Lungs...The Windpipe, Larynx and Pharynx...The Thyroid and Parotid Glands...The Head and its structures...The Brain...The Nerves...The Teeth...The Lower Extremities...The Biflex Canal...Febrile diseases—those of Europe which are not common here...Ophthalmia—popular remedies—proper treatment...Pneumonia—symptoms—Mr. Spooner's prescription for...Bronchitis—symptoms—treatment ...Catarrh—ordinarily not dangerous—preventives...Malignant Epizoötic Catarrh—prevalence in the Northern States—character of the disease has not been understood—prevalence in author's flock—how produced—symptoms—post-mortem appearances—character of the disease ascertained—Nosology—treatment, &c...The Rot—its diagnosis—post-mortem appearances—description of the Fluke—causes of the Rot—treatment...Diarrhea—cause—diagnosis—treatment...Dysentery—cause—difference between it and diarrhea—treatment...Garget—seat and origin of the disease—treatment...Nervous Diseases...Apoplexy—unrecognized cases of it—several cases detailed—symptoms—treatment...Phrenitis...Tetanus...Epilepsy...Rabies...Neither of them common in this country...Paralysis—symptoms—treatment...Colic—symptoms—attributed to intussusception—true cause—treatment.

THE THORACIC VISCERA.

Among these, for convenience, I will include the diaphragm.

The Diaphragm.—The diaphragm or midriff is a muscle extending entirely across the inner cavity of the body, separating the abdomen from the thorax or chest. Its structure is unique, and beautifully adapted to the functions it has to perform. Its outer margin is muscular, giving it the necessary power of contraction, while toward the middle it changes into a transparent tendonous substance. Through this tendonous substance pass the œsophagus, the *aorta*, and the *vena cava*.

If the parts of the diaphragm which immediately surround these vessels had been muscular, every contraction of the former in the act of respiration, would have compressed the latter, and therefore interfered with the passage of the food to the stomach, and the circulation of the blood. In a state of rest the diaphragm is convex toward the thorax. When contracted and flattened, therefore, it enlarges the cavity of the thorax, and air rushes into the lungs. Its alternate contractions and relaxations mainly produce the act of respiration or breathing.

The Thorax.—Without injuring the diaphragm, divide the sternum and brisket of the sheep longitudinally through the center, with a fine saw, and on pulling the lower extremity of the ribs slightly apart, the thorax will be disclosed in its natural arrangement. It consists of three cavities, formed by the doublings of the *pleura*, a thin serous membrane, which lines the whole interior of the chest. Two outer and larger cavities (the right one being the largest), contain the lungs—a third and smaller one, lying between the posterior portions of the former, contains the heart. The œsophagus passes through the upper portion of the thorax, over the lungs and heart, and between them and the spine, to the lower portion of the neck.

The Heart, Arteries, Capillaries, and Veins.—With the size and general appearance of the heart, all are familiar. Enclosed in a membraneous sac—the *pericardium*—it hangs suspended by its superior attachments to the roof of the thorax, its lower extremity nearly reaching to its floor, and pointing toward the left side. The heart has two cavities on each side, termed *auricles* and *ventricles*. The chyle and venous blood are

discharged into the right auricle, and thence into the right ventricle. By the contraction of the latter, its contents are forced through the pulmonary artery into the lungs. The blood having been purified in the lungs, is returned to the left auricle; thence into the left ventricle; and it is then forced into the aorta, or large artery which supplies, by its different branches, all parts of the system with blood. Each compartment of the heart is furnished with appropriate valves to cause the blood to be forced *forward* in its regular course, by the muscular contractions of this viscus. These contractions are the result of an inherent and independent power.

The contractions of the heart force the blood into and along the arteries. When this force begins to be spent as the distance from the heart increases, it receives aid from the action of the muscular coat of the arteries themselves, which forces along the blood to their utmost extremities.

The arteries continue to branch off into more and more minute divisions as they recede from the heart, until the tubes are much less in diameter than the finest hair. These, *capillaries* as they are called, open by exceedingly minute mouths in every part of the frame, for the deposition of those secretions from the blood which maintain the vitality and healthy action of the parts, supply the animal waste, &c.

The capillaries, commencing their return toward the heart, constantly reünite, forming larger tubes which are called *veins*, which bring back such portions of the blood carried out by the arteries, as has not been expended in nourishing the system. The blood now deprived of its oxygen, and loaded with carbon, is unfit for farther circulation until re-purified in the lungs. It is of a darker color than the arterial blood. It is no longer urged on by the contractile power of the tubes through which it flows, but by the partial vacuum formed in the right auricle (as at each contraction it forces its contents into the right ventricle,) and by atmospheric pressure.

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The Lungs.—The lungs are bodies composed of separate minute air-cells, communicating with the *bronchial tubes*, or subdivisions of the windpipe. They also contain many arteries, and veins. On the delicate membraneous walls of the air-cells the venous blood is carried by innumerable tubes so thin as to permit their contents to be acted upon by the atmospheric air which fills the cells at every inspiration. Here the blood gives off its carbon, and receives oxygen from the air, and thus is prepared for its return to the heart, and to be again sent through the system.

The right lung is somewhat larger than the left, and both fill their respective cavities when inflated. They are entirely free from any attachment to the pleura—the membrane which lines the ribs—when in their natural state. When the animal has been bled to death, the lungs are of a light color; but if the animal has died with all its blood in it, their color resembles that of the liver. This can, however, be readily distinguished from *hepatization*—the result of certain diseases—as will be hereafter shown.

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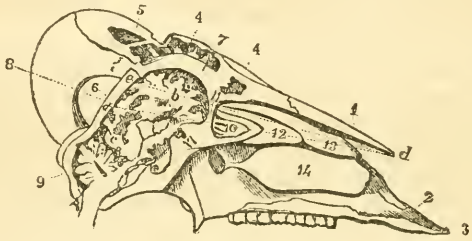
The Windpipe, Larynx, Pharynx, &c.—The bronchial tubes constantly uniting as they approach the anterior portion or root of each lung, finally form a single large tube, as they make their exit from each lobe, and these, uniting into one, form the windpipe. This is a well known cartilaginous tube which passes out of the chest between the first two ribs, and ascends on the front part of the neck. It unites with the larynx, which continues the air passage from the lungs to the mouth. The œsophagus leaves the chest close beside the windpipe, and ascends the neck on the

left side of the latter. It communicates with the pharynx, which communicates with the mouth. The food on being swallowed enters the pharynx or food bag, which is directly above the larynx—so that the food traverses the entrance to the latter. It is deterred from entering the windpipe by the *epiglottis*, a triangular lid or valve which projects upward from the floor of the passage, and which closes upon and covers the *glottis*, or entrance into the windpipe, when any substance more dense than air comes in contact with it in its downward passage.

THE THYROID AND PAROTID GLANDS.—The Thyroid glands are located on each side of the trachea. The parotid glands are situated immediately below the ear, behind the angle of the lower jaw. There are certain other glands situated beneath the lower jaw, not necessary here to be referred to.

THE HEAD AND ITS CONTENTS.

Fig. 49.



BONES OF THE HEAD.

1. The nasal bone.
2. The upper jaw bone.
3. The intermaxillary bone, which supports the pad which supplies the place of upper front teeth.
4. 4. The frontal sinus.
5. Cavity or sinus of the horn, communicating with the frontal sinus. It is here shown by the removal of a section of the base of the horn.
6. The parietal bone.
7. The frontal bone.
8. Vertical section of the brain.
9. Vertical section of the cerebellum.
   a. The cineritious portion of the brain.
   b. The medullary portion.
10. The ethmoid bone.
11. The cribriform or perforated plate of the ethmoid bone. "It separates the nasal cavity from the brain; it is thin almost as a wafer, and pierced by numerous holes, through which the olfactory nerve penetrates, in order to spread itself over the inner part of the nose."
12. The lower cell of the ethmoid bone.
13. The superior turbinated bone.
14. The inferior turbinated bone.
17. The sphenoid bone.

The above cut, copied from Youatt, gives, with the subjoined explanations, a sufficient description of most of the structures of the head. Some, however, demand a little more particular description.

THE BRAIN.—The brain of the sheep is smaller in proportion than that of Man, but is shaped so nearly like the latter, and so closely resembles it in its general structure and conformation, that it furnishes the medical student with a good substitute for the brain of the human subject! The brain is invested in a membrane called the *pia mater*. The cranium or skull is lined by the *dura mater*, and between this and the former there is a delicate membrane called the *tunica arachnoides*.

THE NERVES.—Ten pair of nerves arise from the brain, and thirty pair from the spinal cord. These supply the sense of seeing, hearing, tasting, smelling, feeling, &c. &c.; and a portion of them, termed nerves of mo-

tion, communicate that volition of the brain to the different parts of the system, which produces motion. A description of these various nerves, or even an enumeration of them, would be of no *practical* benefit in a mere popular veterinary treatise.

THE TEETH.—The sheep has 24 molar teeth, and eight incisors. The latter are confined to the lower jaw, being opposed to a firm, hard, elastic pad or cushion on the upper jaw. The incisors are *gouge*-shaped—*i. e.*, concave without and convex within—which enables the sheep to crop the herbage closer to the ground than our other domestic ruminant, the ox.

The lamb is born without incisor teeth, or it has but two. In three or four weeks, it has eight small, shortish ones, as represented in fig. 50.—

Fig. 50.

Fig. 51.

Fig. 52.

Fig. 53. Fig. 54. Fig. 55.

When not far from a year old—though sometimes not until fourteen, fifteen, or even sixteen months old—the two central incisors are shed, and their place is supplied by two longer and broader teeth, as in fig. 51. The sheep is then termed, in this country, a *yearling*, or *yearling past*. Two of the "lamb teeth" continue to be annually shed and their places supplied with the permanent ones until the sheep becomes "*full-mouthed*." Fig. 52 presents the teeth of a two-year-old-past—fig. 53 of a three-year-old-past—fig. 55 of a four-year-old-past. The four-year-old-past is, in reality, nearly or quite five years old, before it obtains its whole number of *fully-grown* permanent teeth. The two-year-old and three-year-old also about reach their next year before their additional incisors are *fully grown*.—Hence, the English writers all speak of two broad teeth (meaning fully-grown ones) as indicating the age of two years; four broad teeth, three years; six broad teeth, four years; and eight broad teeth, or full-mouthed, five years. I prefer the English arrangement, as more accurate, but the other is the common one in the Northern and Eastern States; and, as it is a matter of little practical consequence, it will here be adhered to.

Fig. 54 gives an *inside* view of the incisors of a three-year-old-past—an *outside* view of which is given in fig. 53. The two remaining lamb teeth are here shown, which in the outside view are concealed by the last pair of permanent teeth. From their being thus concealed, the three is often mistaken for the four-year-old-past, by those who do not *count* the permanent teeth.

At six years old, the incisors begin to diminish in breadth. At seven they have lost their fan-like shape, being equilateral, long, and narrow.—At eight, they are still narrower; and this year or the next, reversing the flaring or divergent position in which they are shown in fig. 55, they begin

to point *in* toward the two central ones. Their narrowness and inward direction increases for a year or two more, when they begin to drop out. Sheep fed on turnips or other roots, lose their teeth earlier than those which only receive grain, hay, &c. in winter. At twelve years old, the incisors are usually gone with the exception of one or two loose ones. And here let me remark that when the incisors are reduced to one or two, they should always be twitched out with a pair of nippers. They are useless for the purpose for which they were formed, and they prevent that contact of the lower *gum* with the pad above, which is *now* the only substitute for teeth in cropping grass. When all the incisors are gone, the gums of the lower jaw rapidly harden, and I have known ewes to live for years, keep in fair condition and rear lambs, without an incisor tooth in their heads!

The above remarks are more particularly applicable to the Merino breed. The other breeds, so far as my acquaintance extends, lose their teeth, or become "broken-mouthed" somewhat earlier; and they dwindle away and die soon after they begin to lose their teeth.

THE LOWER EXTREMITIES.

The Biflex Canal.—The lower extremities of the sheep, including the legs, feet, &c., require no anatomical description. I will simply call attention to the biflex or interdigital canal, the nature and diseases of which have been the subjects of so many errors. It is a small orifice opening externally on the front of each pastern immediately above the cleft between the toes. It bifurcates within, a tube passing down on each side of the inner face of the pastern, winding round and ending in a *cul de sac*.

The use of this canal is a matter of doubt. Mr. Spooner thinks the hair always found in it is "*excreted* from the internal surface," and "from the smallness of the opening it cannot escape, or rather is detained for a useful purpose." He continues:

"The use of this canal, thus stuffed with hair, is self-evident. We have mentioned the great motion possessed by this pastern joint, which is so great as to threaten to chafe the skin by the friction of one side against the other. It is to prevent or ward off this friction that these biflex canals, or rather *hair-stuffed cushions*, are provided."

In my judgment, this is a very far-fetched conclusion, and Mr. Youatt's is little more satisfactory. Diseases originating in this canal are sometimes confounded with hoof-ail; and the canal, or a portion of it, is often dissected, or rather *mangled* out by ignorant charlatans in pursuit of an imaginary *worm*, which, they induce the credulous farmer to believe, originates the hoof-ail! The hoof-ail proper has nothing to do with, nor do its characteristic lesions extend to this canal.

FEBRILE DISEASES.

Simple inflammatory, malignant inflammatory, and typhus fevers often devastate the flocks of Europe; but they seem scarcely to be known in the United States, and are included in no American work on the diseases of sheep which has fallen under my eye.

The same remark applies to phrenitis (inflammation of the brain), pleuritis (inflammation of the membrane which lines the thorax), gastritis (inflammation of the stomach), enterctis (inflammation of the intestines), cystitis (inflammation of the bladder), laryngitis (inflammation of the larynx), and several other inflammatory diseases.

Ophthalmia.—Ophthalmia, or inflammation of the eye, is not uncommon

in our country, but is little noticed, as in most cases it disappears in a few days, or, at worst, is only followed by *cataract*. The cataract being usually confined to one eye does not appreciably affect the value of the animal, and therefore has no influence on its market price. As a remedy for this disease, Mr. Grove recommended blowing pulverized *red chalk* into the inflamed eye! Others squirt into it tobacco juice, from that ever ready reservoir of this nauseous fluid, their mouths! I apprehend that all such prescriptions are far worse than nothing.

Conceiving it a matter of humanity to do *something*, I have in some instances drawn blood from under the eye, bathed the eye in tepid water, and occasionally with a weak solution of the sulphate of zinc combined with tincture of opium. These applications diminish pain and accelerate the cure.

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Pneumonia.—Pneumonia, or inflammation of the lungs, is not a common disease, in the Northern States, but undoubted cases of it sometimes occur, after sheep have been exposed to sudden cold—particularly when recently shorn. The adhesions occasionally witnessed between the lungs and pleura of slaughtered sheep, betray the former existence of this disease—though in many instances it was so slight as to be mistaken, in the time of it, for a hard cold. The sheep laboring under pneumonia is dull, ceases to ruminate, neglects its food, drinks frequently and largely, and its breathing is rapid and laborious. The eye is clouded—the nose discharges a tenacious, fetid matter—the teeth are ground frequently, so that the sound is audible to some distance. The pulse is at first hard and rapid—sometimes intermittent; but before death it becomes weak. During the hight of the fever, the flanks heave violently. There is a hard, painful cough during the first stages of the disease. This becomes weaker, and seems to be accompanied with more pain as death approaches.

After death, the lungs are found more or less *hepatized*, *i. e.* permanently condensed, and engorged with blood, so that their structure resembles that of the *hepar*, or liver—and they have so far lost their integrity that they are torn asunder by the slightest force.

It may be well in this place to remark that when sheep die from any cause *with their blood in them*, the lungs have a dark hepatized appearance. But whether actually hepatized or not, can be readily decided by compressing the windpipe, so that air cannot escape through it, and then between such compression and the body of the lungs, in a closely fitting orifice, insert a goose-quill or other tube, and continue to blow until the lungs are inflated so far as they can be. As they inflate, they will become lighter colored, and plainly manifest their cellular structure. If any portions of them cannot be inflated, and retain their dark, liver-like consistency and color, they exhibit hepatization—the result of high inflammatory action—and a state utterly incompatible, in the living animal, with the discharge of the natural functions of the viscus.

With the *treatment* of pneumonia, I have but little personal experience. In the first or inflammatory stages of the disease, bleeding and aperients are clearly called for. Mr. Spooner recommends "early and copious bleeding, repeated, if necessary, in a few hours . . . this followed by aperient medicines, such as 2 oz. of Epsom salts, which may be repeated in smaller doses if the bowels are not sufficiently relaxed. . . . The following sedative may also be given with gruel twice a day:

Nitrate of potash	1 drachm.
Digitalis, powdered	1 scruple.
Tartarized antimony	1 do.

The few cases I have seen have been of a sub-acute character, and would not bear treatment so decidedly and *I* think *dangerously* antiphlogistic.

Mr. Youatt remarks:

"Depletion may be of inestimable value during the continuance—the short continuance—of the febrile state; but excitation like this will soon be followed by corresponding exhaustion, and then the bleeding and the purging would be murderous expedients, and gentian, ginger, and the spirit of nitrous ether will afford the only hope of cure."

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Bronchitis.—It would be difficult to suppose that where sheep are subject to pneumonia they would not also be subject to bronchitis—which is an inflammation of the mucous membrane which lines the bronchial tubes—the air-passes of the lungs. I have seen no cases, however, which I have been able to identify as bronchitis, and have examined no subjects, after death, which exhibited its characteristic lesions. Its symptoms are those of an ordinary cold, but attended with more fever and a tenderness of the throat and belly when pressed upon.

Treatment.—Administer salt in doses from 1½ to 2 oz., with 6 or 8 oz. of lime-water, given in some other part of the day. This is Mr. Youatt's prescription.

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Catarrh.—Catarrh is an inflammation of the mucous membrane which lines the nasal passages—and it sometimes extends to the larynx and pharynx. In the first instance—where the lining of the nasal passages is alone and not very violently affected—it is merely accompanied by an increased discharge of mucus, and is rarely attended with much danger. In this form it is usually termed *snuffles*, and high-bred English mutton sheep, in this country, are apt to manifest more or less of it, after every sudden change of weather. When the inflammation extends to the mucous lining of the larynx and pharynx, some degree of fever usually supervenes, accompanied by cough, and some loss of appetite. At this point the English veterinarians usually recommend bleeding and purging. Catarrh rarely attacks the American fine-wooled sheep with sufficient violence in *summer*, to require the exhibition of remedies. I early found that depletion, in catarrh, in our severe *winter* months, rapidly produced that fatal prostration, from which it is next to impossible to recover the sheep—entirely impossible, without bestowing an amount of time and care on it, costing far more than the price of any ordinary sheep.

The *best* course is to *prevent* the disease, by judicious precautions. With that amount of attention which every prudent flock-master should bestow on his sheep, the hardy American Merino is little subject to it. Good, comfortable, but *well-ventilated* shelters, constantly accessible to the sheep in winter, with a sufficiency of food regularly administered, is usually a sufficient safeguard; and after some years of experience, during which I have tried a variety of experiments on this disease, I resort to no other remedies—in other words, I *do nothing* for those occasional cases of ordinary catarrh which arise in my flock, and they never prove fatal.

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Malignant Epizootic Catarrh.—Essentially differing from the preceding in type and virulence is an epidemic, or, more properly speaking, an epizoötic, malady, which as often as once in eight or ten years sweeps over extended sections of the Northern States, destroying more sheep than all the other diseases put together. It usually makes its appearance in winters characterized by rapid and violent changes of temperature. The Northern farmers speak of these as the "bad winters" for sheep—frequently without assigning any name to the malady. Others term the lat-

ter "*The Distemper*," and others again call it the "*Grub in the Head*," attributing the evil exclusively to the presence of these parasites. The latter, as I shall hereafter show, is an entirely erroneous hypothesis.

The winter of 1846–7 was one of these "bad winters," and the destruction of sheep in New-York, and some adjoining States, was very extensive. Some flock-masters lost half, others three-quarters, and a few seven-eighths of their flocks. One individual within a few miles of me lost five hundred out of eight hundred—another nine hundred out of one thousand! But these *severe* losses fell mainly on the holders of the delicate Saxon sheep, and perhaps, generally, on those possessing not the best accommodations, or the greatest degree of energy and skill.

I lost about fifty sheep during this winter, and never having seen any description of the pathology of this disease, its diagnosis, its lesions—or, in short, any attempt to ascertain its specific character or proper classification in our ovine nosology—I shall attempt to supply some of these omissions. Not dreaming then of a publication of this kind, my notes were only taken for private reference, and were not as full as they should be for a veterinary treatise. I *might* supply some of these omissions accurately from *recollection*, but do not consider it proper thus to *endanger* the accuracy of records, which as far as they go, I think may *now* be *implicitly relied on*. My post-mortem examinations were made at intervals snatched from other pressing engagements. This fact, and certain preconceived views—which I subsequently found *erroneous*—prevented me from making those examinations, and more particularly the *records* of them, as minute and extended as could be wished. I then sought only to convince *myself* of the true nature and character of the disease.

In detailing the results of my experience in the premises, I conceive it a duty to frankly state the *whole facts*. The records of *mismanagement* and *error*, are often as useful, nay, more so, than those of successful management, and it is a pitiful pride which prevents any man, who pretends to communicate information to the public, from giving that public the benefit of his examples which are to be *avoided*, as well as those which are to be *followed*.

Up to February, my sheep remained apparently perfectly sound, and they were in good flesh. Each flock had excellent shelters, were fed regularly, etc., and although sheep were beginning to perish about the country, my uniform previous impunity in these "bad winters" led me to entertain no apprehensions of the prevailing epizoötic. About the first of February, my sheep went into the charge of a new man, hired upon the *highest recommendations*. A few days after, I was called away from home for a week. The weather during my absence was, a part of the time, very severe. The sheep-house occupied by one flock containing one hundred sheep, was, with the exception of two doors, as close a room as can be made by nailing on the wall-boards vertically and without lapping, as is common on our Northern barns.* One of the doors was always left open, to permit the free ingress and egress of the sheep, and for necessary ventilation. A half dozen ewes which had been untimely impregnated by a neighbor's ram, were on the point of lambing, and it being safer to confine the ewes in a warm room over night, the shepherd, instead of removing them to such a room, confined the whole flock in the sheep-house every night, and rendered it warm by closing *both doors!* After two or three hours, the air must have become excessively impure. On entering the sheep-house, on my return, I was at once struck with the fetid, highly offensive smell. A change, too, slight but ominous, had taken place in the

* Boards in these cases shrink so as to leave slight cracks between them.

appearance of a part of the flock. They showed no signs of violent colds, I heard no coughing, sneezing, or labored respiration—and the only indication of catarrh which I noticed, was a nasal discharge, by a few sheep. But those having this nasal discharge, and some others, looked dull and drooping; their eyes ran a little—were partially closed, the caruncle and lids looked pale—their movements were languid—and the shepherd complained that they did not eat quite so well as the others. The pulse was nearly natural—though I *thought* a trifle too languid.

Not knowing what the disease was—and fully believing that depletion by bleeding or physic was not called for, let the disease be what it would. I contented myself with thoroughly purifying the sheep house—seeing that the feeding, etc.,* was managed with the greatest regularity—and closely watching the farther symptoms of disease in the flock. In about a week, the above described symptoms were evidently aggravated, and there had been a rapid emaciation, accompanied with debility, in the sheep first attacked. The countenance was exceeding dull and drooping—the eye kept more than half closed—the caruncle, lids, &c. almost bloodless—a gummy yellow secretion below the eye—thick glutinous mucus adhering in and about the nostrils—appetite feeble—pulse languid—and the muscular energy greatly prostrated. Nothing unusual was yet noticed about their stools or urine.

I now had all the diseased sheep removed from the flock, and placed in rooms the temperature of which could be easily regulated.

I commenced giving slight tonics and stimulants, such as gentian, ginger, etc., but apparently with no material effect. They rapidly grew weaker, stumbled and fell as they walked, and soon became unable to rise. The appetite grew feebler—the mucus at the nose, in some instances, tinged with dark grumous blood—the respiration oppressed, and they died within a day or two after they became unable to rise.

I proceeded to make some post-mortem examinations, which I shall here detail, although, as I have before remarked, they are extremely imperfect. I was at first inclined to suspect that the primary disease was one of some of the abdominal or thoracic viscera, and this impression was confirmed by the abnormal condition of these viscera in the first subjects examined. I therefore improperly confined my attention to these, and some of the external tissues, *without any examination of the interior organs of the head and neck.* I shall give my notes verbatim as they were taken down at the time, whether the appearances detailed have, as I *now believe*, any connection with the fatal disease or not.

Case 1st. Old sheep. Much emaciated—mouth and lips covered with yellow froth—yellow waxy matter under eyes—adhesive mucus in and about nostrils. On opening, external tissues appear healthy—two hydatids on omentum of the size of a walnut—gall-bladder enlarged and enormously distended with pale, and apparently not properly eliminated bile—gall-bladder slightly adhering to omentum—mesenteric glands enlarged—other abdominal viscera believed to be normal—fæces in rectum thought to indicate a constipated habit—stomachs rather empty. Thoracic viscera healthy.

Case 2d. Two years old. External appearances as in Case 1st, with the exception of the yellow froth about the mouth. External tissues healthy. Gall-bladder very small and nearly empty—bile pale and uneliminated—mesenteric glands enlarged—schirrous tumor at the junction

* They had been fed with bright hay three times a day, and turnips. As those affected as above did not eat their turnips well, I commenced feeding some oats, *in addition* to the turnips. I believed that a generous feed was called for, and I gave it.

of the cœcum and colon of the size of a butternut. Superior lobe of left lung adherent to pleura costalis—three lobes of right lung ditto, with slight traces of *recent* inflammation. Hydro-pericarditis—the pericardium slightly inflamed and containing something more than a gill of serum.

Case 3d. Old, and in lamb. External appearances and tissues as in Case 2d. Omentum dark-yellowish, or yellowish-brown by deposition of lymph, the result of inflammatory action—gall-bladder precisely as in Case 2d—tabes mesentrica or enlargement of the mesenteric glands, as in the preceding cases. Middle lobe of right lung slightly hepatized, and adherent to pleura costalis—hydro-pericarditis, (a gill of serum in pericardium.)

Case 4th. Yearling ram. External appearances and tissues as in preceding cases. Two small hydatids on omentum—gall-bladder as in two preceding cases—mesenteric glands as in preceding cases. Traces of diarrhea. Thoracic viscera healthy.

Case 5th. Lamb. External appearance as in preceding cases—omentum as in Case 3d, and small hydatid on it—gall-bladder as in three preceding cases—ditto of mesenteric glands. Thoracic viscera healthy.

Case 6th. Four-year-old ram, killed for examination, in the first stage of the disease. Yet strong, appetite good, in fair condition, and exhibited no particular external indications of disease except running at the eyes, a slight gummy deposition below them—and some mucus about the nostrils. Gall-bladder but little better filled than in preceding cases—mesenteric glands same as in preceding cases. Thoracic viscera healthy.

Remarks on Preceding Cases.—I had started on the supposition that the fatal disease would be found one of the lungs, consequent on catarrh. I thought it *might* prove a species of pneumonia, though some of the characteristic symptoms of that disease seemed to be wanting; but I believed it would rather prove to be phthisis pulmonalis, or pulmonary consumption. To the last disease, when it assumes the form of what is popularly called "quick consumption," it seemed to me to bear several striking analogies. But the post-mortem examinations above detailed, entirely overthrow these suppositions. Except in Case 2d, there were no manifestations of *recent* inflammation of the lungs. The adhesions in Case 3d, were evidently referable to a past date. In the other four cases, the lungs were in a healthy condition—exhibiting not a trace of hepatization, tubercles, ulcers, or other abnormal action! In Case 6th, where the disease was in its first observable and therefore inflammatory stage, *none* of the thoracic viscera presented a particle of inflammation!

Then what *was* the disease? It was evidently the same in the several cases, yet the lesions disclosed by post-mortem examination were very various. Hence, I was led to conclude that these lesions were the results of *symptomatic* disease, and that the *primary* one was not yet discovered.

The malady continued to spread. New cases occurred daily—it began to exhibit itself in my other flocks. It had manifestly put on the character of an epizoötic—or, if I may be permitted to coin a word, an en-zoötic. I now gave orders to have every sheep removed from the several flocks, *as soon* as it should be attacked with disease. I also resolved on more extended post-mortem examinations. The following are the notes taken in the immediately succeeding cases.

Case 7th. Yearling. External appearance as in the preceding cases—external tissues normal—mesenteric glands slightly enlarged—gall-bladder of natural size, with good bile, and with the natural discolorations about it. Thoracic viscera healthy, with exception of pericardium, which exhibited traces of recent inflammation and contained a gill of serum

The thorax also contained considerable fluid, which escaped without admeasurement.

I now examined the bronchial tubes, the lower portions of the windpipe, œsophagus, &c., and found them all in an apparently healthy condition. Before tracing these passages to the throat, I removed the upper portion of the skull and carefully examined the brain and its investing membranes. All seemed in a perfectly normal state. I then made a longitudinal section down through the middle part of the whole head, as is shown in fig. 49, and *the seat and character of the fatal malady stood at once revealed!*

The mucous membrane lining the whole nasal cavity, highly congested and thickened throughout its whole extent, betrayed the most intense inflammation. At the junction of the cellular ethmoid bones with the cribriform plate, (in the ethmoidal cells,) slight ulcers were forming on the membraneous lining! The inflammation also extended to the mucous membrane of the pharynx, and say three inches of the upper portion of the œsophagus. Here it rather abruptly terminated.

Case 8th. Old, in lamb. External appearances as in preceding cases—abdominal parietes healthy—all the viscera apparently healthy. The inflammation of the mucous membrane lining the nasal cavity, pharynx, and upper portion of œsophagus, as in Case 7th, only not quite so acute—no ulcers on the membrane.

Cases 5th and 6th *reviewed.* The heads of these two subjects having been accidentally preserved; I examined them, and found the inflammatory action of the mucous membrane same as in cases 7th and 8th. Nor have I a particle of doubt that the same would have been found the case in *all* the preceding subjects, had they been examined.

Nosology and Treatment.—I had little difficulty in coming to the conclusion that the primary and main disease was a species of catarrh. It evidently, however, differed from ordinary catarrh in its diagnosis, and in the extent of the lesions accompanying both the primary and symptomatic diseases.

In no case, even in the first attack, did I notice anything—the fever—the accelerated pulse—the redness about the eyes and nostrils—the coughing, etc., accompanying an ordinary severe attack of catarrh. And it was for this reason that I was misled as to the seat of the malady. From the very outset, according to my observations, the type of the disease was typhoid—sinking—rapidly tending to fatal prostration.

How to reduce the local inflammation of the membrane lining the nasal cavities, I was at a loss to determine. I was satisfied that there was too much debility to admit of an antiphlogistic course of treatment. Still, to make myself sure, I bled in three or four cases, and, as I anticipated, it evidently accelerated the fatal catastrophe. Blistering could not be brought near to the seat of the inflammation, excepting on the nose, and independent of the extreme difficulty of treating a blister on a spot so constantly exposed to dirt, the rubbing of hay, etc., in winter feeding, I believed it could have little effect, on an account of the thick nasal bone intervening between it and *any portion* of the inflamed membrane. And, moreover, the greater portion of the inflamed membrane rested on bones detached, except at one extremity, from all connection with the nasal bone. I blew Scotch snuff (through paper tubes) up the nostrils of some of the sheep, for two objects—1, to remove, by sneezing, the mucus, which mechanically, and evidently injuriously, obstructed respiration; and 2, to produce a new action, by which an increased mucous secretion would be excited, and thus the congested membrane relieved. But, farther than this, I re-

sorted to no local or other treatment designed specifically to reach the local inflammation.

The next step was to fix on the constitutional treatment. The liver was evidently in a torpid state. There was a functional derangement in the mesenteric and probably other glands, and a want of activity in the general secretory system. What medicine would stimulate the liver, cause it to secrete the proper quantity as well as quality of bile, change the morbid action of the glands and secretory system, and restore activity and health to the vital functions generally? In my judgment, nothing promised so well as mercury; and by its well known effect on the entire secretory system, it would powerfully tend to relieve the congested membranes of the head. In this opinion I was joined by a learned and experienced physician, who, both as a matter of taste and humanity, has given no little attention to veterinary science and practice. The proto-chloride of mercury (calomel) was supposed to possess too much specific gravity to reach the fourth stomach, with any certainty, administered in a liquid; and if administered as a ball or pill, it would be almost *sure* not to reach that stomach.* The dissolved bi-chloride of mercury (corrosive sublimate) was therefore hit upon. One grain was dissolved in two ounces of water, and one-half ounce of the water (or one-eighth of a grain of corrosive sublimate) was exhibited in a day, in two doses.

As constipation existed in most of the cases, it was thought that the bowels required to be stimulated into action, and slightly evacuated with a mild laxative. Having noticed in similar cases of debility and torpor of the intestinal canal, that purgation is often followed by a serous diarrhea, difficult to correct, and leading to rapid prostration, and there being no intestinal irritation to suffer exacerbation, I thought that rhubarb—from its well known tendency to give tone to the bowels, and its secondary effect as a mild astringent—was particularly indicated. It was given in a decoction—the equivalent of ten or fifteen grains at a dose—accompanied with the ordinary carminative and stomachic adjuvants, ginger and gentian, in infusion.

To a portion of the sheep I administered the rhubarb and its adjuvants alone; to others I gave the bi-chloride of mercury *in addition* to the preceding. I employed these courses of treatment in a number of cases, the records of all which have been accidentally destroyed with the exception of the following three.

Case 9th. Ram, three years old. Has been drooping and weak, with feeble appetite, for some time—has been separated from flock. Has eaten his oats irregularly for several days, and refused turnips, bran, etc., altogether—much emaciated—eyes partly closed, with a yellowish deposit below them—caruncle and lids bloodless—nostrils impeded with adhesive yellowish mucus.

March 17th. Weaker than before—would not rise to feed—not seen to eat or ruminate—gait, when helped up, weak and staggering; eyes nearly closed—stooled dry, hard fæces—urine dark and reddish. Exhibited rhubarb with ginger and gentian in gruel—blew snuff into nostrils. March 18th, morning—Weaker; refused to eat anything. Exhibited rhubarb, ginger and gentian in gruel. Noon—Urine seemingly bloody: breathing labored: exhibited corrosive sublimate in gruel. Night—Dying. March 19th, morning—Dead.

Post-mortem appearances. Inner edges of both lobes of liver softened about two inches from horizontal fissure: hypropericarditis and hydro-

* For reasons which will be hereafter given under the head of "The Proper Way of Administering Medicines."

thorax—nearly half pint of serum in latter. Other viscera apparently normal. Lining of superior portion of œsophagus and nasal cavity as in Case 8th.

Case 10th. Three-year-old ewe. Drooping for several days: sleepy—emaciated and weak: cannot rise without help: appearances about nostrils and eyes as in Case 9th: appetite considerable—rumination not observed. March 17th. Exhibited ginger and gentian in gruel: blew snuff in nostrils. Latter produced sneezing and a discharge of mucus. 18th: Morning. Weaker and would not eat. Noon. A little livelier: ate hay and grain; exhibited ginger and gentian. Night. Evacuations thin: urine of a natural color. 19th. Morning: same. Noon. Exhibited same remedies as before. The same course was pursued for three days: the sheep appearing rather to gain, when one morning it was found dead. No post-mortem examination made.

Case 11th. Old ewe. Symptoms precisely as in Case 10th, except an occasional grinding of the teeth. March 17th. Treated exactly as in Case 9th. Lived three days and appeared to rally a little, then brought forth a lamb and died. Post-mortem examination. Abdominal parietes healthy—gall-bladder filled with pale bile: liver normal in size but softened throughout its entire extent, and pale: portions of it paler and more disorganized than others: no parasites in its ducts. Thoracic viscera normal. Sub-acute inflammation of the mucous lining of the nasal cavity, and of the superior portion of the œsophagus. Slight ulcer in the ethmoidal cells.

I made various other post-mortem examinations. Some of the viscera in every case were in a more or less abnormal state; but there was the same variety in the locality of the diseased action as in the preceding cases. But so far as the seat and character of the catarrhal affection was concerned, it was *uniform in every case.* The only difference was in intensity, as exhibited by the extent of the lesions.

Not a single sheep recovered after the emaciation and debility had proceeded to any great extent! One such only lingered along until shearing. Its wool gradually dropped off: it seemed to rally a little once or twice, and then relapse; and it perished one night in a rain-storm. In the generality of instances the time from the first observed symptoms until death, varied from ten to fifteen days. A few died in a shorter time.

In the three cases last detailed, the disease had evidently proceeded too far to be arrested by *any* treatment. I much regret the loss of the records of the other cases, which would throw farther light on the subject. I *thought* that the treatment produced favorable effects in some instances—particularly when resorted to at the commencement of the disease. At all events, some of the sheep recovered under the treatment—particularly under that including the exhibition of the bi-chloride of mercury—and very few, if any, recovered without any treatment. Candor compels me to say, however, that the results of the treatment were far from being *highly* satisfactory—that the cases of recovery were much fewer than the deaths. I have merely stated what I believe to be the facts in the premises; I do not feel prepared to make *any recommendations.*

The epizoötic gradually abated toward spring, and my flock have since been in perfect health.

Near spring, many farmers found what seemed to them an unusual number of grubs in the head (frontal sinuses) of the sheep which died of the prevailing epizoötic, and therefore they attributed the disease to this cause, and this seems to be the prevailing popular opinion. In some of the *latest* cases in my flock, I discovered more or less grubs; and, in two or three instances, an unusual number. In other cases where the external symp-

toms and the post-mortem appearances were almost identical, no grubs were to be seen. For this reason, and others which I shall assign when treating of grub in the head, I conclude that the popular opinion is erroneous.

THE ROT.—The existence and prevalence of the Rot in the United States have been sufficiently alluded to in Letter XIV. Notwithstanding its comparative rareness here, so far as is known, at present, I think it expedient to give a full description of it. It may be more prevalent hereafter, or it may be found peculiar to localities where sheep have not yet been introduced. And whether so or not, as its existence will often be feared and suspected in diseased flocks, it is proper that the flock-master always have it in his power to clearly identify this terrible destroyer.

The diagnosis of the disease is thus given by Mr. Spooner.*

"The first symptoms attending this disease are by no means strongly marked; there is no loss of condition, but rather apparently the contrary; indeed, sheep intended for the butcher have been purposely *cothed* or rotted in order to increase their fattening properties for a few weeks, a practice which was adopted by the celebrated Bakewell. A want of liveliness and paleness of the membranes generally may be considered as the first symptoms of the disease, to which may be added a yellowness of the caruncle at the corner of the eye. Dr. Harrison observes, 'when in warm, sultry or rainy weather, sheep that are grazing on low and moist lands feed rapidly, and some of them die suddenly, there is fear that they have contracted the rot.' This suspicion will be farther increased if, a few weeks afterward, the sheep begin to shrink and become flaccid about the loins. By pressure about the hips at this time a crackling is perceptible now or soon afterward, the countenance looks pale, and upon parting the fleece the skin is found to have changed its vermilion tint for a pale red, and the wool is easily separated from the pelt; and as the disorder advances the skin becomes dappled with yellow or black spots. To these symptoms succeed increased dullness, loss of condition, greater paleness of the mucous membranes, the eyelids becoming almost white and afterward yellow. This yellowness extends to other parts of the body, and a watery fluid appears under the skin, which becomes loose and flabby, the wool coming off readily. The symptoms of dropsy often extend over the body, and sometimes the sheep becomes *chockered*, as it is termed—a large swelling forms under the jaw, which, from the appearances of the fluid it contains, is in some places called the *watery poke*. The duration of the disease is uncertain; the animal occasionally dies shortly after becoming affected, but more frequently it extends to from three to six months, the sheep gradually losing flesh and pining away, particularly if, as is frequently the case, an obstinate purging supervenes."

Mr. Youatt thus describes the post-mortem appearances:†

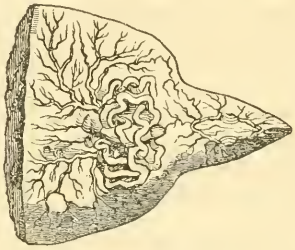
"When a rotted sheep is examined after death, the whole cellular tissue is found to be infiltrated, and a yellow serous fluid everywhere follows the knife. The muscles are soft and flabby: they have the appearance of being macerated. The kidneys are pale, flaccid, and infiltrated. The mesenteric glands enlarged, and engorged with yellow serous fluid. The belly is frequently filled with water or purulent matter; the peritoneum is everywhere thickened, and the bowels adhere together by means of an unnatural growth. The heart is enlarged and softened, and the lungs are filled with tubercles. The principal alterations of structure are in the liver. It is pale, livid, and broken down with the slightest pressure; and on being boiled it will almost dissolve away. When the liver is not pale, it is often curiously spotted. In some cases it is speckled like the back of a toad. Nevertheless, some parts of it are hard and schirrous; others are ulcerated, and the biliary ducts are filled with flukes. Here is the decided seat of disease, and it is here that the nature of the malady is to be learned. *It is inflammation of the liver.* . . . The liver attracts the principal attention of the examiner: it displays the evident effects of acute and destructive inflammation; and still more plainly the ravages of the parasite with which its ducts are crowded. Here is plainly the original seat of the disease—the center whence a destructive influence spreads on every side. . . . The Fluke—the *Fasciola* of Linnæus—the *Distoma hepaticum* of Rhodolphi—the *Planaria* of Goese—is found in the biliary ducts of the sheep, the goat, the deer, the ox, the horse, the ass, the hog, the dog, the rabbit, the guinea-pig, and various other animals, and even in the human being. It is from three quarters of an inch to an inch and a quarter in length, and from one-third to half an inch in greatest breadth.

* Spooner, p. 391, et supra.
† Youatt, p. 447, et supra.

Figs. 56 and 58 represent this parasite of its usual size and appearance, and its resemblance to a minute sole, divested of its fins, is very striking. The head is of a pointed form, round above and flat beneath; and the mouth opens laterally instead of vertically.

Fig. 56. Fig. 57. Fig. 58.

Fig. 59.



THE FLUKE.

There are no barbs or tentaculæ, as described by some authors. The eyes are placed on the most prominent part of the head, and are very singularly constructed (fig. 57). They have the bony ring of the bird. . . . The anastomoses of the blood-vessels which ramify over the head are plainly seen through a tolerable microscope. The circulating and digestive organs are also evident, and are seated almost immediately below the head. The situation of the heart is seen in fig. 56, and the two main vessels evidently springing from it, and extending through almost the whole length of the fluke. Smaller blood-vessels, if so they may be called, ramify from them on either side. The convolutions of the bowels appear in fig. 59, and the vent, both for the fæces and the ova, and probably for the connection between the sexes, is on the under part, and almost close to the neck. . . . .

In the belly, if so it may be called, are almost invariably a very great number of oval particles, hundreds of which, taken together, are not equal in bulk to a grain of sand. They are of a pale red color, and are supposed to be the spawn or eggs of the parasite. . . . .

There can be no doubt that the eggs are frequently received in the food. Having been discharged with the dung, they remain on the grass or damp spot on which they may fall, retaining their vital principle for an indefinite period of time. . . . They find not always, or they find not at all, a proper nidus in the places in which they are deposited; but taken up with the food, escaping the perils of rumination, and threading every vessel and duct until they arrive at the biliary canal, they burst from their shells, and grow, and probably multiply. . . . .

Leeuwenhoek says that he has taken 870 flukes out of one liver, exclusive of those that were cut to pieces or destroyed in opening the various ducts. In other cases, and where the sheep have died of the rot, there were not found more than ten or twelve. . . .

Then, is the fluke worm the cause or the effect of rot? To a certain degree both. They aggravate the disease; they perpetuate a state of irritability and disorganization, which must necessarily undermine the strength of any animal. . . . . Notwithstanding all this, however, if the fluke follow the analogy of other entoza and parasites, it is the effect and not the cause of rot. . . . .

The rot in sheep is evidently connected with the soil or state of the pasture. It is confined to wet seasons, or to the feeding on ground moist and marshy at all seasons. It has reference to the evaporation of water, and to the presence and decomposition of moist vegetable matter. It is rarely or almost never seen on dry or sandy soils and in dry seasons; it is rarely wanting on boggy or poachy ground, except when that ground is dried by the heat of the summer's sun, or completely covered by the winter's rain. On the same farm there are certain fields on which no sheep can be turned with impunity. There are others that seldom or never give the rot. The soil of the first is found to be of a pervious nature, on which wet cannot long remain—the second takes a long time to dry, or is rarely or never so. . . . .

Some seasons are far more favorable to the development of the rot than others, and there is no manner of doubt as to the character of those seasons. After a rainy summer or a moist autumn, or during a wet winter, the rot destroys like a pestilence. A return and a continuance of dry weather materially arrests its murderous progress. Most of the sheep

that had been already infected die ; but the number of those that are lost soon begins to be materially diminished. It is, therefore sufficiently plain that the rot depends upon, or is caused by, the existence of moisture. A rainy season and a tenacious soil are fruitful or inevitable sources of it. . . . . The mischief is effected with almost incredible rapidity."

Mr. Youatt here gives various instances to prove that rot is engendered in a few hours and even minutes.* He farther says :

"It is an old observation that all pasture that is suspected to be unsound, the sheep should be folded early in the evening, before the first dews begin to fall, and should not be released from the fold until the dew is partly evaporated. . . . .

Then the mode of prevention—that with which the farmer will have most to do, for the sheep having become once decidedly rotten, neither medicine nor management will have much power in arresting the evil—consists in altering the character of as much of the dangerous ground as he can, and keeping his sheep from those pastures which defy all his attempts to improve them. . . . . If all unnecessary moisture is removed from the soil, or if the access of air is cut off by the flooding of the pasture, no poisonous gas has existence, and the sheep continue sound. . . . .

The account of the *treatment* of rot must, to a considerable extent, be very unsatisfactory."

Mr. Youatt proceeds to recommend the *sale* of sheep to the *butcher* when they are found to be rotted! Rot hastens for a short period the accumulation of fat. Bakewell—a man whose name is associated with the exhibition of prodigious abilities in the improvement of stock, but, in my mind, tarnished also by an equal exhibition of selfishness and absolute meanness—displayed a characteristic sagacity in *purposely* rotting his sheep to avail himself of the above circumstance!† It is with pain I make the following quotation from Youatt—the only thing of such a character I remember to have noticed in his voluminous works :

"It is one of the characters of the rot to hasten, and that to a strange degree, the accumulation of flesh and fat. Let not the farmer, however, push this experiment too far. Let him carefully overlook every sheep daily, and dispose of those which cease to make progress, or which seem beginning to retrograde. It has already been stated that the meat of the rotted sheep, in the early stage of the disease, *is not like that of the sound one;* it is pale and not so firm; but it is not unwholesome (!) and it is coveted by certain epicures, *who, perhaps, are not altogether aware of the real state of the animal (!!)* All this is *matter of calculation*, and must be left to the owner of the sheep; except that, if the breed is not of very considerable value, and the disease has not proceeded to emaciation or other fearful symptoms, the first loss will probably be the least; and if the owner can get anything like a tolerable price for them, the sooner they are sent to the butcher, or *consumed at home*, the better. Supposing, however, that their appearance *is beginning to tell tales about them*, and they are too far gone to be disposed of in the market or consumed at home, are they to be abandoned to their fate? No: far from it."

Conceding to Mr. Youatt the whole benefit of that saving clause about "consumption at home," the above sentence is one which I could well wish stricken from his valuable work. The sale of the meat of diseased animals, for human consumption, is abhorrent to decency and propriety, and there is not a respectable American family which would not revolt at the idea of either selling or consuming such meat.

Of the treatment of rot, Mr. Youatt continues :

"If it is suited to the convenience of the farmer, and such ground were at all within his reach, the sheep should be sent to a salt-marsh in preference to the best pasture on the best farm. There it will feed on the salt incrusted on the herbage, and pervading the pores of every blade of grass. A healthy salt-marsh permits not the sheep to become rotten which graze upon it; and if the disease is not considerably advanced, it cures those which are sent upon it with the rot. . . . Are there any indications of fever—heated mouth, heaving flanks, or failing appetite? Is the general inflammation beginning to have a determination to that part on which the disease usually expends its chiefest virulence? Is there yellow-

* Youatt, p. 453.
† So say both Spooner and Youatt.

ness of the lips and of the mouth, of the eyes, and of the skin? At the same time, are there no indications of weakness and decay? Nothing to show that the constitution is fatally undermined? Bleed—abstract, according to the circumstances of the case, eight, ten, or twelve ounces of blood. There is no disease of an inflammatory character at its commencement which is not benefited by early bleeding. To this let a dose of physic succeed—two or three ounces of Epsom salts, administered in the cautious manner so frequently recommended; and to these means let a change of diet be immediately added—good hay in the field, and hay, straw, or chaff, in the straw-yard.

The physic having operated, or an additional dose, perchance, having been administered in order to quicken the action of the first, the farmer will look out for farther means and appliances. . . . . Two or three grains of calomel may be given daily, but mixed with half the quantity of opium, in order to secure its beneficial, and ward off its injurious effects on the ruminant. To this should be added—a simple and cheap medicine, but that which is the sheet-anchor of the practitioner here—common salt. . . . . In the first place, it is a purgative inferior to few, when given in a full dose; and it is a tonic as well as a purgative. . . . . A mild tonic, as well as an aperient, is plainly indicated soon after the commencement of rot. The doses should be from two to three drachms, repeated morning and night. When the inflammatory stage is clearly passed, stronger tonics may be added to the salt, and there are none superior to the gentian and ginger roots; from one to two drachms of each, finely powdered, may be added to each dose of the salt. . . . . The sheep having a little recovered from the disease, should still continue on the best and driest pasture on the farm, and should always have salt within their reach. . . . . The rot is not infectious."

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Diarrhea.—This disease is often more properly a *nervous* than a *febrile* one—in the former case, a morbid increase of the peristaltic motion of the bowels—in the latter, an inflammation of the *mucous* coat of the smaller intestines. But for the purpose of viewing it in connection with dysentery, to which it is sometimes closely allied, and into which it often runs—and which is clearly a febrile disease—it will be described here.

Common diarrhea, purging, or scours, manifests itself simply by the copiousness and fluidity of the alvine evacuations. It is brought on by a sudden change from dry feed to green, or by the introduction of improper substances into the stomach. It is important to clearly distinguish this disease from dysentery. In diarrhea there is no apparent general fever; the appetite remains good; the stools are thin and watery, but unaccompanied with slime (mucus) and blood; the odor of the fæces is far less offensive than in dysentery; the general condition of the animal is but little changed.

Treatment.—Confinement to dry food for a day or two, and a gradual return to it, oftentimes suffice. I have rarely administered anything to grown sheep, and never have lost one from this disease. To lambs, especially if attacked in the fall, the disease is more serious. If the purging is severe, and especially if any mucus is observed with the fæces, the feculent matter should be removed from the bowels by a gentle cathartic—as half a drachm of rhubarb, or an ounce of linseed-oil, or half an ounce of Epsom salts to a lamb. This should always be followed by an astringent, and in nine cases out of ten, the latter will serve in the first instance. I generally administer, say, $\frac{1}{4}$ oz. of prepared chalk in half a pint of tepid milk, once a day for two or three days, at the end of which, and frequently after the first dose, the purging will have ordinarily abated or entirely ceased.

The following is the formula of the English "sheep's cordial" usually prescribed in cases of diarrhea by the English veterinarians, and there can be no doubt it is a safe and excellent remedy—better probably than simple chalk and milk, in severe cases: Take of prepared chalk one ounce, powdered catechu half an ounce, powdered ginger two drachms, and powdered opium half a drachm; mix them with half a pint of peppermint water—give two or three table-spoonsfull morning and night to a grown sheep, and half that quantity to a lamb.

Dysentery.—Dysentery is caused by an inflammation of the mucous or inner coat of the larger intestines, causing a preternatural increase in their secretions, and a morbid alteration in the character of those secretions. It is frequently consequent on that form of diarrhea which is caused by an inflammation of the mucous coat of the smaller intestines. The inflammation extends throughout the whole alimentary canal, increases in virulence, and it becomes dysentery—a disease frequently dangerous and obstinate in its character, but fortunately not common among sheep in this part of the United States. Its diagnosis differs from that of diarrhea in several readily observed particulars. There is evident fever; the appetite is capricious, ordinarily very feeble; the stools are as thin or even thinner than in diarrhea, but much more adhesive in consequence of the presence of large quantities of mucus. As the erosion of the intestines advances, the fæces are tinged with blood; their odor is intolerably offensive; and the animal rapidly wastes away. The course of the disease extends from a few days to several weeks.

Treatment.—I have seen but a few well-defined cases of dysentery, and in the half-dozen instances which have occurred in my own flock, I have usually administered a couple of purges of linseed-oil, followed by chalk and milk as in diarrhea (only doubling the dose of chalk), and a few drops of laudanum, say twenty or thirty—with ginger and gentian. According to my recollection, about one-third of the cases have proved fatal, but they have usually been old and feeble sheep.

Farther inquiry satisfies me that moderate bleeding should be resorted to in the first or inflammatory stage of the disease, or whenever decided febrile symptoms are found to be present.

Mr. Youatt prescribes bleeding, cathartics, mashes, gruel, &c. He says:

"Two doses of physic having been administered, the practitioner will probably have recourse to astringents. The sheep's cordial will probably supply him with the best; and to this, tonics may soon begin to be added—an additional quantity of ginger may enter into the composition of the cordial, and gentian powder will be a useful auxiliary. With this—as an excellent stimulus to cause the sphincter of the anus to contract, and also the mouths of the innumerable secretory and exhalent vessels which open on the inner surface of the intestine—a half grain of strychnine may be combined. . . . . Smaller doses should be given for three or four days."

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Garget—Is an inflammation of the udder, with or without general inflammation. Where simply an inflammation of the udder, it is usually caused by a too great accumulation of milk in the latter prior to lambing, or in consequence of the death of the lamb. It is not the serious malady, here, described by the English veterinarians.

Treatment.—Drawing the milk partly from the bag so that the hungry lamb will butt and work at it an unusual time in pursuit of its food, and bathing it a few times in *cold** water, usually suffices. If the lamb is dead, the milk should be drawn a few times, at increasing intervals, washing the udder for some time in cold water at each milking. In cases of obdurate induration, the udder should be anointed with iodine ointment. If there is general fever in the system, an ounce of Epsom salts may be given.

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NERVOUS DISEASES.

Apoplexy.—Soon after the sheep are turned to grass in the spring, one of the best conditioned sheep in the flock is sometimes suddenly found dead.

* The English veterinarians recommended *warm* fomentations.

The symptoms which precede the catastrophe are occasionally noted. The sheep leaps frantically into the air two or three times, dashes itself on the ground and suddenly rises, and dies in a few moments. Such cases occur but now and then, and none have ever occurred in my flock to my knowledge. I have therefore had no opportunity of observing the diagnosis, or making dissections. There can be little doubt, however, that the disease is apoplexy.

Desirous to raise the condition of a poorish flock (the poorest sheep culled from my other flocks) somewhat too rapidly, perhaps, some winters since, in addition to good hay three times a day, I ordered them fed a gill of oats per head; and as rapidly as it could be done without bringing on scours, I had them fed a liberal allowance of Swedish turnips—about as much as they would eat up clean. They gained perceptibly. One day a sheep was reported to me as having become suddenly blind and motionless. I immediately examined it. It was in good fair condition. It stood with its head a little down—its eyes were glassy and staring—it was stone blind! The evening before nothing unusual had been perceived about it. I bled it at the inner angle of each eye, and the blood had scarcely started before its sight began to return. In less than a minute it walked off among its companions. It had no relapse. Another case was soon reported; I treated it in the same way, and with the same apparent effect. The symptoms soon returned, however, and I bled again. This appeared to produce but a partial restoration of the sight. The sheep would not follow its companions into and out of the sheep-house. When approached, it would run about knocking its head against fences, &c. It lost condition, finally became unable to rise, and died. Another one, after being bled, fed regularly, but its sight was never restored. It lived along thus for three or four weeks, and then fell into a hole containing water, and perished. Another apparently recovered, all but sight, and continued in my flock for more than a year afterward. The eye was bright and *clear*, as in *gutta serena*, and the blindness would not be suspected, unless the sheep was cornered up. Then, if the catchers remained momentarily *still*, it would as soon run into their arms or against the fence, as in any other direction. Perhaps fifteen cases occurred. In three or four instances the *blind* sheep, when they moved, constantly traveled round in a circle. In about as many cases, they twisted themselves about without progressing, the head was drawn round toward one side, they fell, ground their teeth, and their mouths were covered with a frothy mucus. In neither of the latter description of cases did bleeding at the inner angles of the eyes afford anything more than temporary relief. They all proved fatal.

At the time these things occurred, I regret to say that I had paid but very little attention to veterinary science, and had never made a dissection. I did nothing but bleed at the inner angles of the eyes, and made no post-mortem examinations.

Taking into consideration the feed and the symptoms, there can be but little doubt, I think, that all these cases were referable to a *determination of blood to the brain*. The sheep were not *fat*, but the secretions of blood were rapidly and powerfully increased by rich and abundant food.

Treatment.—If the eyes are prominent and fixed, the membranes of the mouth and nose highly florid, the nostrils highly dilated, and the respiration labored and stertorous, the veins of the head turgid, the pulse strong and rather slow, and these symptoms attended by a partial or entire loss of sight and hearing, it is one of those decided cases of apoplexy which require immediate and decided treatment. As the good effects of vene-

section, in all cases, and especially in this, depend not only upon the amount of blood abstracted, but also upon the rapidity with which it is drawn from the veins, the eye-veins are not the proper ones to open. They are so small that the blood flows slowly, and if cut directly *across*, as is usually done, they soon contract, and the flow of blood is arrested before a sufficient quantity has been abstracted. It is better to have recourse at once to the jugular vein. The animal should be bled until an obvious constitutional effect is produced—the pulse lowered and the rigidity of the muscles relaxed. An aperient should at once follow bleeding, and if the animal is strong and plethoric, a sheep of the size of the Merino would require at least two ounces of Epsom salts, and one of the large mutton sheep more. If this should fail to open the bowels, half an ounce of the salts should be be given, say, twice a day.

In the milder cases which I have mentioned as occurring in my own flock, I think had I bled more thoroughly, in the very first attack, and given a mild aperient of Epsom salts, most of the sheep would have recovered.

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Phrenitis, Tetanus, Epilepsy, Palsy, Rabies.—I never have seen a well-defined case of either of these maladies among our sheep, though, in a few instances, something which struck me at the time as somewhat analogous to paralysis or palsy. Palsy is a diminution or entire loss of the powers of motion in some part of the body. I have occasionally seen, in the winter, poor lambs, or poor pregnant ewes, or poor feeble ewes immediately after yeaning in the spring, lose the power of walking or standing rather too suddenly to have it satisfactorily referable to increasing debility. The animal seems to have lost all strength in its loins, and the hind-quarters are powerless. It makes ineffectual attempts to rise, and cannot stand if placed upon its feet.

Treatment.—Warmth, gentle stimulants, and good nursing, might raise the patient, but in nineteen cases out of twenty it would be more economical and equally humane, to at once deprive it of life.

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Colic.—Sheep are occasionally seen, particularly in the winter, lying down and rising every moment or two, and constantly stretching their fore and hind legs so far apart that their bellies almost touch the ground. They appear to be in much pain, refuse all food, and not unfrequently die, unless relieved. This disease is popularly known as the "*stretches*," and is erroneously attributed to introsusception of an intestine. Some farmers worry the sheep with a dog, and others hold it up by the hind legs, to effect a cure! I consider it a sort of flatulent colic induced by costiveness.

Treatment.—Half an ounce of Epsom salts, a drachm of ginger, and sixty drops of essence of peppermint. The salts alone, however, will effect the cure, as will an equivalent dose of linseed-oil, or even hog's lard.

A Female Farmer.—The second premium for the best cultivated farm in Litchfield Co., Ct., awarded the past season to Mrs. Vesta Hawkins, of Watertown.

The farm contains one hundred and sixty acres. It has been under her management for the last ten years. The Committee of Examination say: "It is divided the present season into twenty-three acres of meadow, three and one-half corn, six of oats, one and a half of rye, two of buckwheat, a half acre of potatoes, seven acres of wood-land and the residue of pasture land." The produce of the farm for the past season is estimated as follows: fifty tons of hay, two hundred bushels of corn, one hundred and thirty-three shocks of oats, and one hundred and fifty bushels of potatoes. The stock kept on it last season consisted of twenty-six head, including six calves, two horses, and fifty-six sheep. This farm is conveniently laid out in small fields, the fences mostly of rails, all in good repair, and with the buildings, presenting a neat and tidy appearance.

ITEMS ABOUT TURNIPS AND OTHER ROOT CROPS,

WITH VARIOUS OTHER SUBJECTS INTRODUCED INCIDENTALLY—READ AND SEE.

In the full persuasion that American agriculturists may not have sufficiently dwelt upon the value of the Turnip Crop—we mean particularly the Swedish Turnip—as food for cattle and sheep, as well for nutriment as for increasing the bulk and the value of their farm-yard manure—we shall bring together such items as we may meet with, and that may serve to awaken public attention to their importance, and perhaps remove some of the prejudice which has prevented their cultivation more extensively. We select turnips from other root crops, because they are made by a simpler process, demand less labor in tending and storing, and if *sowed in time* in land well prepared, will, as it is believed, yield a much more remunerating crop than is generally believed. The apprehension which has most deterred farmers from the cultivation of them, has been the fear of drouth and the quantity of labor, together with a want of practical knowledge of their actual value as compared with other food.

Be it, then, our endeavor to throw some light on these points in the course of what we shall select and what we shall say.

The largest crops that have fallen under our personal observation—such as appeared comparable with those that are realized in England, where this root is said to give meat and bread to the nation, and indirectly to uphold the Government—crops which in fact appeared to be amply remunerating—have been those we have seen at Mr. Corning's, near Albany, under the skillful management of Mr. Sotham; and at Marshfield, under the general superintending direction of the "Great Expounder" himself.

We don't propose to give instructions for their culture, except in one extract; for sometimes we think practical farmers must really be surfeited with reading, again and again, the same old stories about common field practice, every form and process of which has been so often repeated; and as respects the different kinds and the culture of turnips, no one need desire more information than we have given in Stephens's Book of the Farm.

Our object will be rather to show, by examples of crops here and there, as we see accounts of them, what has been done in our country, and thence to insist on what *may be done* when this shall be made, as other crops have been, an object of special attention and trial, under a persuasion of its real value. The first item within reach comes to us in that very sensible, practical and judicious paper, the 'Massachusetts Ploughman,' whose agricultural department never fails to repay to us the attention which it always attracts. In an account of one of their late Club meetings in the Hall of Legislation:

Mr. Brooks, of Princeton, went into an estimate of the relative values of different roots for stock compared with hay. He had not grown turnips extensively. From ¼ of an acre he had grown 100 to 150 bushels. For young stock he counts them *as good as hay, pound for pound.* They do not fatten like potatoes, but keep the bowels open. Potatoes are better for milch cows than any kind of turnips.

We may venture to claim acquaintance with Mr. Brooks, and know him to be in judgment and character altogether reliable. Here we see that 500 bushels to the acre can be counted on.

Mr. S. W. Cole exhibited a large, irregular cabbage turnip. He said this kind yields as well as the ruta-baga, and will keep as long. He raised 200 bushels in drills between his nursery rows. He lets them stand a foot or more apart in the rows. Thinks he could raise 800 bushels per acre.

J. W. Proctor, Esq., of Danvers, thought we ought to inquire which of the roots we can raise to the best advantage—beets, turnips, or carrots. He thought carrots most profitable; beets exhaust the soil; 35 tons of carrots had been grown on an acre in Essex county; 32 tons were not uncommon—worth eight dollars a ton. Carrots are good to prepare the ground for onions. 100,000 bushels of onions had been grown in Danvers in a year. Five hundred bushels is a common crop per acre. 800 bushels have been made to the acre.

Thirty-two tons at $8—$256 to the acre! Do not these cases show the advantages of a policy that produces factories and villages all over a State, to consume, *on the spot*, these bulky commodities? It is there that swamps and marshes, and the rich lands, are brought under the plow and the spade. Will the reader look back to our quotation in this number, page 476, from Hon. J. R. Poinsett, addressed to the Agricultural Society of South Carolina, as to the effect of home manufactures on the prosperity of States that encourage them?

The following Table may be useful in other respects, while it shows how familiarly English writers speak of from *thirty to fifty tons of turnips to the acre:*

CALCULATION OF SPACES, WEIGHTS AND PRODUCTS.

Distances between the drills.	Distances between the plants.	Space occupied by each.	Number per imperial acre.	Wt. of each turnip.	Total wt. per acre.
Inches.		Square inches.	Number there should be		Tons. Cwts.
27	9 inches between sound whites.	243	24.813	at 3 lbs....34 at 5 lbs....57	11 12
27	10 inches between yellow turnips.	270	23.232	at 4 lbs....41 at 5 lbs....51	8 15
27	12 inches between Swedes.	324	19.360	at 3 lbs....25 at 4 lbs....34 at 5 lbs....43	19 12 5

How much more nutriment, according to this Table, does an acre produce in turnips than in hay, if Mr. Brooks's opinion of their comparative value should even nearly approach to accuracy, more than making up for the vast difference in the expense of the two crops?

The nutritive properties of the white turnip, however, according to Sir Humphry Davy, are but 42 in 1,000, and we cannot but suspect that Mr. Brooks, for whose general intelligence and judgment we have great deference, very much overrates the nutritive properties of this root as compared with hay.

But let us proceed. We have concluded to take up the subject thus early because, for those who would propose to make experiments on a considerable scale, it is not too soon to be thinking about the land most suitable—how it is to be put in the best order, and where the manure is to come from. It presents a fair case for the use of bones or guano. But, after all, while farmers are thinking and talking, and Editors writing so much about manures, and looking for short cuts to arrive at great results, is it not to be doubted whether we are not losing sight too much of that good old system of Tull, the father of agricultural improvement in England?—we mean *thorough tillage!*—putting the ground itself in the nicest and best possible condition! Will our readers please *think of that?*

We have somewhere, as it is believed, lately seen that a premium was awarded by the Queens County Agricultural Society for a crop of turnips of *eight hundred bushels to the acre!*

Nearly twenty-nine years ago, in the old American Farmer, while yet it was

the only agricultural paper, and was still far from paying its way, we published accounts of four hundred bushels of ruta-bagas to the acre, and gave full instructions about them. Cobbett was the first to make a great stir about them in our country. It will be seen that Johnston rates an average crop at not much short of one thousand bushels.

As far back as 1821—twenty-six years ago—we published an account of a crop of turnips, 834 heaping bushels made on an acre of land, by Joseph W. March of Greenland, who gave under his own signature the following account of the mode of culture:

Last fall about one-half of the lot was plowed, and it was intended the whole should have been plowed, but the early hard frost prevented. Last spring about eight loads of compost manure were spread on the ground and plowed in, two-thirds of which probably was swamp and mixed with barn-yard dung.

On the 18th of June, I began to plant the seed. After harrowing the ground, seven furrows were made lengthwise the piece, three and a half feet apart, with a horse plow. Into these furrows good barn-yard manure was shoveled from a cart passing alongside, at the rate of about fourteen loads per acre. Then a strong ox-team with a good plow passing up one side and down on the other, plowing very deep, formed a high ridge directly over the manure. After the seven ridges were plowed, a horse going between two ridges with a light roller leveled the tops; then a hoe was drawn along to make a small furrow for the seed. Previous to dropping it, some manure was strewed along at the rate of four to five loads per acre, in order to force the growth of the young plants, when first up, that the fly might not destroy them. A boy then dropped the seed along the ridges, a few in a place, about a foot apart, then covering them with a hoe completed the manner of sowing.

The principal labor in the after culture, was the first weeding and thinning out the plants. But as this was done in the season of hay making, at times when the weather was unfit for making hay, the expense is considered trifling. I should judge, however, that the labor of the after culture is about equal to that of Indian corn.

The produce of the acre is *eight hundred and thirty-four heaped bushels of turnips*, besides of leaves what was judged to be about five tons. The expense of harvesting was comparatively very small; the whole being done in a part of one day. Upon calculation made of the time, and number of hands employed, it appeared that five men could easily have pulled them up, gathered them into carts, and housed them (after hauling them a distance of more than a quarter of a mile) in one day.

In the same year we published an account from Thomas Hillen, near Baltimore—as truthful a man as any to be found in a day's ride, and as a practical farmer, an honor to the State. He had turnips to measure from twenty-nine to thirty and a half inches round, and gathered from one-quarter of an acre 155 bushels; from 3¼ acres and 14 perches, although part of the ground was made quite unproductive by superfluous moisture—1,665 bushels. They weighed 61 pounds to the bushel; from an eighth of an acre he got 5,108 pounds; from a quarter of an acre 9,455; and from the three-and-a-quarter acres and fourteen perches 101,565 pounds. Agricultural Societies have continued to offer premiums for patches of turnips, and will to the end of the chapter. This mode of proceeding produces, as is seen, that sort of excitement which is begotten by lotteries. They would do much better to offer a premium of $50 or a piece of plate; and better still, *books* of the value of $50, for the best Essay—one that should most thoroughly discuss and indicate to the agricultural community, whether, and under what circumstances, and for what uses, turnips can be *profitably sustituted for other crops*. In the one case they would elicit and impart valuable practical information; in the other they stimulate some man to go to an enormous expense on a quarter of an acre, to have it said that he won a prize for doing what has been done for the last thirty years by others.

The New-York State Agricultural Society awarded the following premiums lately at Albany, for the following root crops. The one for turnips goes to show what can be done, and ought to be satisfactory as to the soil and climate of this

State at least. Under the wise regulations of this Society, constantly improving, and especially of late years, in its administration of the office it has undertaken, the winner of this turnip premium, Mr. Hastings, has doubtless been required to detail with particularity the whole process, and *all* the expenses ; and that account, instead of being published at once, far and wide in the agricultural and other papers, through which the whole community could get it, at a cost of a cent or two, will some year probably make its appearance in a few big volumes, to be *given* away to a few persons, all of whom are well able, but many of them too miserly to subscribe to an agricultural paper, though they can find means to pay for a *party sheet*—or to be given out again as premiums.

Not an agricultural journal is patronized by the State Agricultural Society—although the Cultivator, the Agriculturist and the Genesee Farmer have done ten thousand times more to diffuse knowledge and keep alive a spirit of inquiry, than all the agricultural societies and institutes in the State, from their foundation to the present day. But for the agricultural and the general Press, these institutions could not sustain existence. Any one of the papers we have named, diffuses fifty times as much information, and to ten times as many people, as their Volumes of Transactions. Let agricultural journals be suspended, and we should see all these Societies gasping for breath, like mice in an exhausted receiver. The following were the premiums for crops:

FIELD CROPS.

Indian Corn.—Geo. Vail, Troy, (2 acres, 67 bushels per acre,) $20.

Spring Wheat.—Robert Eells, Westmoreland, Orange Co., (2 acres, 20½ bushels per acre,) $8.

Barley.—Benjamin Enos, De Ruyter, Madison Co., (2 acres, 39 bushels per acre,) $10. E. C. Bliss had not sufficient land for premium.

Oats.—Charles W. Eells, Kirkland, Oneida Co., (2 acres, 35¾ bushels per acre,) $10. Benj. Enos, De Ruyter, Madison Co., (71 bushels per acre,) $8.

Beans.—E. C. Bliss, Westfield, Chautauque Co., (31¼ bushels per acre,) $8.

Flax.—Wm. Newcomb, Pittstown, Rensselaer Co., (half acre,) $5.

ROOT CROPS.

Potatoes.—Daniel Newcomb, Pittstown, Rensselaer Co., (1 acre, 405 bushels,) $10. Martin Springer, Brunswick, Rensselaer Co., (360 bushels,) $8.

Ruta-Bagas.—Joseph Hastings, Brunswick, (1 acre, 1,317 bushels,) $10.

Carrots.—Wm. Risley, Fredonia, Chautauque Co., (half acre, 557 bushels,) $8.

It will be seen that Mr. Vail, the worthy President of the Society, and now, like all his predecessors, a Member of the Executive Committee, *ex officio*, bore off the premium for the heaviest crop of corn—67 bushels to the acre on two acres.

Fifty years ago, a wager of fifty guineas was laid between Mr. John Stevens, of Hoboken, and Mr. Daniel Ludlow, of Westchester, who would make the greatest crop of Indian corn on an acre of land. Mr. Ludlow made 98 bushels and 14 quarts, and was beaten by his competitor, who made 118 bushels and 2 quarts—not far from double the State Society premium crop in 1847. What then comes of the effect of these premiums after a repetition for so many years? If the Society persist in offering them, should they not require that the crop should be equal, at least, to any recorded, *and* that it be the result of a process, take it altogether, which it would be *advisable and profitable for farmers generally to follow?* If the object be to ascertain merely what *can* be done, has not that been shown every year for fifty years? We speak only of what appears to us to be the true policy. It would be much easier, more agreeable, and more profitable, to praise everything, or to "lay dark;" but that 's a policy we shall not practice while acting as one of the humblest sentinels over the interests of the agricultural community.

A writer of great candor and credibility before the American Revolution, put down the usual wheat crop above Albany at from 20 to 40 bushels. And here would seem to be an appropriate place for introducing the following Tables from one of Johnston's Lectures. They may serve for frequent reference, and we are persuaded will be found very acceptable. Perfect and exact precision is not expected in such cases, but who can be better relied on for a near and reliable approximation to it than he?

AVERAGE COMPOSITION AND PRODUCE OF NUTRITIVE MATTER PER ACRE, BY EACH OF THE USUALLY CULTIVATED CROPS.

1st. *Average Composition.*—The relative proportions of the several most important constituents contained in our cultivated crops vary, as we have seen, with a great number of circumstances. The following Table exhibits the average composition of 100 parts of the more common grains, roots and grasses, as nearly as the present state of our knowledge upon the subject enables us to represent it:

	Water.	Husk, or woody fibre.	Starch, gum, and sugar.	Gluten, albumen, legumin, &c.	Fatty matter.	Saline matter.
Wheat	15	15	55	10 to 19	2 to 4	2
Barley	15	15	60	12 to 15	2 to 3	3
Oats	16	20	60	14 to 19	5 to 7	4
Rye	12	10 to 20	60	10 to 15	3 to 4	2
Indian Corn	14	6	70	12	5 to 9	1½
Buckwheat	15	25	50	8	0·4?	4
Rice	13	3	75	7	0·7	0½
Beans	14	8 to 11	40	24 to 28	2 to 3	3
Pease	14	9	50	24	2·1	3
Potatoes	75	4	18	2·0	0·3	¾ to 1½
Turnips	88	2	9*	1·5	0·3	½ to 4·5
Carrots	85	3	10	1·5	0·4	1½ to 2
Mangel-wurzel	85	2	11	2·0	?	¾ to 1¼
Meadow hay	14	30	40	7·1	2 to 5	5 to 10
Clover hay	14	25	40	9·3	3 to 5	9
Pea straw	10 to 15	25	45	12·3	1·5	4 to 6
Oat straw	12	45	35	1·3	0·8?	6
Wheat straw	12 to 15	50	30	1·3	2 to 3½	5
Barley straw	do.	50	30	1·3	?	5
Rye straw	do.	45	38	1·3	?	4
Indian Corn. do	12	25	52	3·0	1·7	3 to 7

Some of the above numbers are approximations only. The proportions of fatty matter especially, are in many instances very uncertain.

2d. *Gross Produce per Acre.*—The gross produce, per acre, of the different crops varies in different districts of the country. The weight of each crop in pounds, however, will, in general, approach to one or other of the quantities represented by the numbers in the following Table:

	Produce per acre.	Weight per bushel.	Total weight in pounds.
Wheat	25 bushels.	60 lbs.	1,500
--	30 --		1,800
Barley	35 --	53 lbs.	1,850
--	40 --		2,120
Oats	40 --	42 lbs.	1,680
--	50 --		2,100
Rye	25 --	54 lbs.	1,350
--	30 --		1,620
Indian Corn	30 --	60 lbs.	1,800
Buckwheat	30 --	46 lbs.	1,380
Beans	25 --	64 lbs.	1,600
--	30 --		1,920
Peas	25 --	66 lbs.	1,650

	Weight of produce.		Weight of produce.
Potatoes	6 tons	Carrots	25 tons
--	12 --	Meadow hay	1½ --
Turnips	20 --	Clover hay	2 --
--	30 --		

Wheat straw	3,000 lbs.	Rye straw	4,000 lbs.
--	3,600 --	--	4,800 --
Barley straw	2,100 --	Bean straw	2,700 --
--	2,500 --	--	3,200 --
Oat straw	2,700 --	Pea straw	2,700 --
--	3,500 --		

* In the turnip, carrot, and mangel-wurzel, it will be remembered that pectic acid takes the place of starch.

3d. *Average Produce of Nutritive Matter per Acre.*—In the *gross* produce above given, there are contained, according to the first Table, the following *average* proportions of nutritive matter of various kinds:

Average Produce of Nutritive Matter of different kinds from an Acre of the usually cultivated Crops.

	Gross produce.		Husks or woody fibre.	Starch, sugar &c	Gluten, &c.	Oil or fat.	Saline matter.
	Bush.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Wheat	25	1,500	225	825	150 to 280	30 to 60	30
--	30	1,800	270	990	180 to 340	36 to 72	36
Barley	35	1,800	270	1080	210 to 260	36 to 54	50
--	40	2,100	315	1260	250 to 310	42 to 63	60
Oats	40	1,700	340	1000	230 to 320	80 to 120	70
--	50	2,100	420	1050	290 to 400	75 to 150	80
Rye	25	1,300	130 to 260	780	130 to 200	40 to 50	26
--	30	1,600	160 to 320	960	230 to 350	48 to 64	32
Indian Corn	30	1,800	100	1260	216	90 to 170	27
Buckwheat	30	1,300	320	650	100?	5?	21
Beans	25	1,600	160	640	380 to 450	32 to 48	48
--	30	1,900	190	760	450 to 530	38 to 57	57
Peas	25	1,600	130	800	380	34	48
	Tons.						
Potatoes	6	13,500	540	2400	270	45	120
--	12	27,000	1080	4800	540	90	240
Turnips	20	45,000	900	4000	670	130	300
--	30	67,000	1340	6000	1000	200	450
Carrots	25	56,000	1680	5600	840	200	800
Mangel-wurzel	20	45,000	900	4950	900	?	450
Meadow hay	1½	3,400	1020	1360	240	70 to 170	220
Clover hay	2	4,500	1120	1800	420	135 to 225	400
Pea straw		2,700	675	1200	330	40	135
Wheat straw		3,000	1500	900	40	60 to 100	150
--		3,600	1800	1080	48	70 to 120	180
Oat straw		2,700	1210	950	36	?	135
--		3,500	1570	1200	48	?	175
Barley straw		2,100	1050	630	28	?	105
--		2,500	1250	750	33	?	125
Rye straw		4,000	1800	1500	53	?	160
--		4,800	2200	1800	64	?	200

The most uncertain column in this Table is that which represents the quantity of oil or fat contained in the several kinds of produce. The importance of the whole Table to the practical man will appear more clearly when we come to treat of the feeding of stock.

N. B. We have just noted, as we go along, a communication from "*A Stranger*," to the Marlboro' Gazette, in which, giving an account of a visit to Mr. Charles Hill, of Prince George's County, Maryland, he says:

"But that which interested me most, and which I have deemed worth communicating to the public through the columns of your able paper, is the cheap method Mr. H. has adopted this winter of feeding his cows. Seeing and tasting is *believing*, and both tests I applied to his fine butter, which was very nice and agreeable to the taste, while its color was rich and beautiful. This butter is made from common cows—not *fresh* cows, either, fed on corn fodder and corn shucks, with a liberal supply of the white turnip boiled well. No *meal* or bran is used—nothing but a little salt to season the turnip *wash*, as he terms it. From six indifferent cows he is enabled to supply an uncommonly large family of children with plenty of fine milk, an abundance of rich milk and cream for his table, and makes from fifteen to twenty pounds of this good butter per week. This *fact* is worth a thousand arguments. It establishes the great value of white turnip for milch cows. Either prejudice or ignorance has so often asserted that they were of no value, that our farmers have believed without making a fair trial, and have abandoned their culture except for table use."

Laudable as is this advance step, in Maryland management, we must say it is not common to get butter of rich and beautiful color and flavor in winter season from white turnips. Why does not Mr. Hill sprinkle into the "wash" a quart of Indian meal a day for each cow? It can't be because *he* can't afford it; but on the score of sheer economy, let him try it for a month and see if it does not tell *profitably*, both on the quantity and quality of their butter. Still, the example goes far enough to be of much value for our purpose, as showing what can be done, with ease and with very remunerating results.

We should sow the last of July, with a good season, rather than run the risk of another early in August, though we have known, under very favorable circumstances, even in our boyish days, a heavy crop to come in Calvert County, from seed sown on the 10th of September, on old cow-penned land. If men won't try, and that *in the right way*, how do they know what can be done?—There 's a *way* in doing everything, as there is a right and a wrong side in *mounting a horse*. There is no crop so carefully prepared for in England, whose very Government is said to rest on turnips, as the *turnip crop*. For them it is meat and meal.

REARING AND FEEDING CALVES.

[Abridged from the German.]

Having had 34 years' experience in rearing calves, I hope you will excuse the liberty I take in sending you the following account of my practice—especially as I have found my method so much better than allowing the calves to suck their mothers. Whether the animals were intended for *keepers* or *feeders*, I have always found that my method brings them soonest to perfection. It is shortly this:

1. For the first week the calf receives daily six quarts of new milk, as warm as it comes from the cow, in three portions—at morning, noon, and night. I carefully adhere to these three times of feeding for the first 12 weeks.

2. In the second week the milk is increased by half a pint at each feeding time; so that the calf receives, according to its strength, not less than 6¾ to 7 quarts per day.

3. In the third week the calf no longer receives new milk, but the milk of the previous day skimmed; always taking care to warm the milk slightly, and at the same time increasing the quantity, so that the daily ration is now 7½ quarts. I also commence at this time to introduce into the drink small portions of boiled linseed, or linseed meal and crushed peas.*

4. I proceed in the same manner in the fourth, fifth and sixth weeks, except that the milk is increased each week by half a pint at every feeding-time, so that in the fourth week the calf receives 8¼, in the fifth 9, and in the 6th 9¾ quarts of milk daily; the animals also receiving more and more linseed meal, crushed peas, or rye meal in their drinks, which are always lukewarm.

5. In the next six weeks I gave them their food cold—with, however, more of these mixtures; the latter are always increased with the quantity of the milk, because too much liquid food is very apt to make the calves poor and pot-bellied. During this period I also take from them a portion of their milk, adding in its place such a portion of the linseed or other substances mixed with warm water as still to make the total quantity of each day's drink (increased, as I have said before, by half a pint at each meal) in the seventh week 10½ quarts, and in the twelfth week 14¼ quarts per day.

6. Whoever pays proper attention to the feeding of his cattle will soon discover whether the proportion of food named be sufficiently rich or not, and can easily add or diminish the proper quantity.

7. There can be no animal so stupid about its food as the calf; it must therefore be taught from its earliest infancy. For this purpose, in teaching them to take their food when mixed with the linseed meal, &c., we generally begin by giving a small handful of oatmeal, and placing within their reach some good hay, or, if the season will afford it, some green food.

8. When the calves are twelve weeks old, the milk is entirely taken from them, and they receive in its place rye meal or crushed peas, made into pulp with water, and then thinned; the daily ration being increased until the end of the second quarter from 14½ to 20 quarts.

9. When the calves are half a year old, the drinking food is gradually lessened and thinned—the quantity being regulated by the natural thirst of the animals, as it gradually takes on to more substantial food.

10. The following is the statement of the expense of bringing up a calf until one year old:

1. The first 14 days 91 quarts of good milk.
2. From the second to the sixth week, 242 quarts of skimmed milk (12 hours old).
3. From the seventh to the twelfth week, 252 qts. of very poor milk (24 hours old.)
4. Half ewt. of linseed meal.
5. Three bushels of crushed peas.
6. Two bushels of rye meal.
7. Hay, oats, green food, &c.

Total expense of these in Germany, £3 sterling.

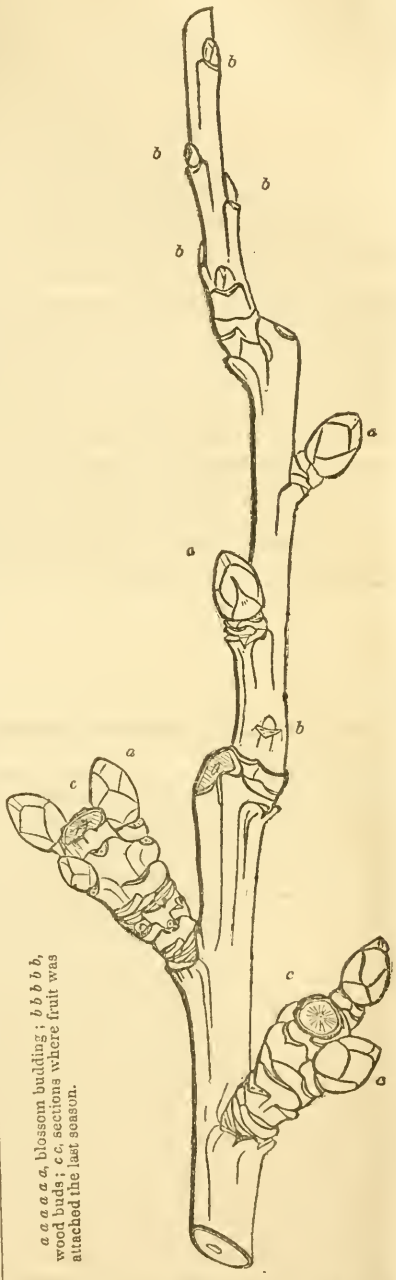
* Corn meal might be substituted for flax-seed, and for beans or other meal.

PRUNING.—THE APPLE TREE.

The Apple tree, left to its natural growth, forms generally a low stem, branching out into a top, which ultimately becomes hemispherical, toward the outside of which fruit-spurs, leaves, and fruit are most abundant: to support these branches interiorly may be considered as a sort of framework, for they are often destitute of spurs or foliage. In pruning and training it is necessary to bear this natural tendency of growth constantly in mind; for although that tendency may be subdued or diverted to suit the purposes of cultivation, yet it cannot be annihilated while the trees are young, and as vigorous as they ought to be. A tree may be prevented from growing up with a single stem by cutting back; then several shoots usually result, and these become so many smaller stems, if not interfered with. Like the individual stem, they are not disposed to bear fruit; their tendency is to be merely pillars or supporters of a system of elevated ramifications, at the extremities of which fructification naturally takes place. Being aware of this, the operations of pruning and training necessary to be performed when the tree is to be grown in any particular form different from its natural habit, will be better understood. The modes in which the Apple tree is grown are numerous. The principal are, as standards, open dwarfs, pyramids, trained against espaliers, and against walls.

A *Standard*, properly managed, should have a clean, straight, and substantial stem. By substantiality of stem is here meant a structure capable of supporting itself without bending, and hence not requiring the aid of stakes. In general, this property is too little thought of; or at its expense, the other properties are endeavored to be obtained. The following will illustrate this. Supposing it were required to grow an Apple tree with a stem (if such it might be called) fifteen feet in length, yet nowhere more than an inch in diameter; the way to effect this would be to train a maiden plant to a rod, taking care to allow no side-shoots to grow, nor any leaves, excepting a very few at top. By adopting a similar proceeding year after year, the stem will reach the hight above-mentioned, and be like a slender, flexible rod, almost of uniform thickness, which would instantly bend to the ground on being deprived of its support. It must be considered a work of misapplied art; for naturally the plant would have put forth side-shoots and leaves as it advanced; and these leaves would have contributed to the formation of layers of wood, increasing the thickness of the base; thus the stem would have become an elongated cone, a form adapted for self-support.

From what has been stated, it is obvious that the necessity for stakes is owing to the improper management of the plant while the stem is being reared; and this again from the erroneous idea that a sufficiently clean stem cannot be produced unless it be stripped of



a a a a a, blossom budding; *b b b b*, wood buds; *c c*, sections where fruit was attached the last season.

leaves, twigs, in short of everything but the bark. Every leaf which appears along the young stem should be encouraged. If any strong shoot break out, let it be checked; but all other laterals should be allowed to go on at least to the end of July, when they may be stopped by pinching off their points. In the following autumn cut them off closely from the lower portion of the stem, and shorten the rest back to one eye. In the following season these eyes will push fresh shoots; treat them like their predecessors in summer, and clear an additional portion of the stem below, in autumn, by closely cutting the laterals which may have pushed therefrom. By this mode of procedure, self-supporting stems can be generally insured.

The formation of the top must now be considered. The hight of clear stem being determined, the upright leader exceeding that hight in summer by several inches, must be shortened back at the ensuing winter-pruning, so that the lowest of the three buds immediately below the section shall correspond with the intended hight of stem. These three buds will give rise to three shoots, which should be encouraged for the commencement of the branches of the tree. Each of them, as they proceed in growth, should be made to diverge at an angle of about 45°, or half way between the horizontal and perpendicular directions; and at the same time, the shoots should be kept equidistant from each other. At the winter-pruning, they should be shortened to within nine inches or a foot of their bases; particularly observing to cut above two buds pointing outward in the direction which it would be desirable the shoots proceeding from them should take.—Six limbs will thus be originated. Again, a little attention in summer will ensure an equal divergence of the shoots from the perpendicular, and equal distances from each other. Meanwhile a gradual divestment of the temporary shoots on the stem is presumed to have annually taken place as above recommended. The scars resulting from the suppression of those on the lower part of the stem will have nearly or quite healed over; for this process will be greatly accelerated by the action of leaves on shoots left above. It may be observed that after all these temporary shoots are removed from them, their beneficial effects continue; for the roots formed by their agency still remain to contribute to the future growth of the tree.

After the principal branches have been started, it would be well to regulate the growth of the top for a few years longer, by checking, about midsummer, any shoots that are over-luxuriant, or that are taking a wrong direction. Afterward, little pruning will be required. The branches should be kept thin enough to admit sufficient sun and air; and after bearing heavy crops, portions of the extremities should be a little shortened.

CULTURAL OBSERVATIONS ON THE POTATO FOR 1848.

It seems on all hands to be agreed that *early* planting of the potato is advisable. The first point of importance is selecting and cultivating the earliest kinds, and at the earliest possible season; not that early varieties have been less subject to disease than others, for if cultivated at a late period of the summer all have proved alike affected. Hence the utility of treating late kinds as precocities, which plan, be it remarked, we have had recourse to with success, by raising them in pots on slight heat, early in April, and planting them out finally in May on open compartments, taking precaution to cut down the haulm or straw at the end of July, and in this way we have obtained an abundant sound crop, and large, which has kept well up to the present time. We recommend our friends to adopt the same plan, and we vouch for satisfactory results, for we flatter ourselves this is a decided cultural improvement in late kinds, and of national importance, as we conceive nearly double the land usually allotted to them will be required to produce ample supplies of early potatoes if late ones become extinct. Upon the same principle they may be ripened earlier on a larger scale by simply plastering a warm bed 2 inches thick with puddled dung or loam, which will more readily adhere to the roots when transplanted, then placing the sets firmly, as close as they may be conveniently removed with a trowel, finally covering them about 2 inches with light mould, precisely as with dahlias, to be slightly protected in case of frost until their final destination in May. We hope this will induce those who are about to raise potatoes from seed to be as early in the field as circumstances will admit, as the greater probability of success depends on raising them before the ordinary time, also of obtaining early selected seed, as seeds gathered and raised indiscriminately have signally failed, while the former have produced a crop of sound tubers, and many of ample size for the table the first year. For the encouragement of tyros in this department, we observe that on 7 rods under this early treatment, we have from one small packet of selected seed, value 7d., obtained 5 bushels of seedlings, sufficient to plant half an acre of land, which we intend to plant the ensuing season, not fearing success. We would farther add that no one need be ap-

prehensive of the impracticability of planting seedlings, as our best crops were obtained last season from seedlings of 1846, though diminutive in size as compared with those of 1847. In short, by superior cultivation, full crops may be obtained from seedlings not larger than peas. Also note, that seeds selected from a distinct early kind invariably produce tubers akin to the parent stock, while from those collected promiscuously or inadvertently, are produced a progeny in various sporting varieties; consequently, from their late tendency, many of them have fallen victims to the prevailing epidemic. HARDY & SON, *Maldon.*

PROGRESS OF THE AMERICAN CHEESE TRADE.

THE Detroit Free Press, the State paper of Michigan,, furnishes the following statement of this new and rather important branch of trade:

The Cheese trade is rapidly augmenting in this country. The foreign exports of it have become a prominent article of supply for distant climes. Up to 1840 there was but a small quantity shipped, and that principally on foreign account. That year Messrs. Goodrich & Co., of New-York, and the Messrs. Green, of Boston, made the experiment of large consignments to England. Of course, they met with the usual prejudices, the market before having been furnished with foreign cheese from Ireland and Holland. By perseverance the American article gradually came into favor, until it has now reached a heavy consumption. It fills part of the cargo of almost every vessel that leaves our seaports for Liverpool. The statistics of export, as will be seen by the following, betoken a still farther extension, which is worthy the attention of the farmers of this State:

1840	lbs. 723,713	1843	lbs. 3.440,144
1841	1,748,781	1844	7,433,145
1842	2,456,677	1845	7,941,187
1846	8,675,390		

This foreign export trade has now reached over a million of dollars annually. It goes to fifty-two countries. Our heaviest customers in 1846 were—

England	lbs. 6.744,699	Hayti	lbs. 150,046
West Indies	807,040	British Guiana	162,420
Cuba	227,276	Scotland	88,041
Canadas	185,915	Venezuela	40,812

Until within five years, cheese has usually been kept on sale in our Eastern cities by grocers and produce dealers, with a general assortment of other products. A total revolution in this respect has taken place. In New-York and Boston, extensive houses, exclusively for cheese, are doing a large business. Several commission houses are now solely engaged in it.

The farmers of our State seem to have neglected this important branch of the dairy. Every other salable product is produced here in abundance; why not add this to our list of exports? We certainly possess the grazing land. Still we do not make 20 per cent. of the cheese consumed in the State. Daily it is shipped here from Buffalo, and goes into the interior of this State. Ohio also sends her hundreds of tons to our markets. Neither Western New-York nor Ohio possesses more advantages for its manufacture than our own farmers. We are told that at the prices it has borne for the last five years it is much more profitable than butter. In fact, for three months in the year, butter does not sell at any higher price. All dairy-women agree that two pounds of cheese are made easier than one pound of butter. Yet it is neglected.

In several towns near Buffalo, (Hamburgh and Collins,) it is the principal business of the farmers, and all who have embarked in it have greatly added to their wealth. Chautauque County farmers have increased their cows for cheese-making; Herkimer County, N. Y., produced 8.000,000 lbs. in 1845, according to the State Census; St. Lawrence 9,000,000 lbs. In Allegany County, heretofore, lumber was the principal production; nearly every farmer now turns out his five to twenty casks of cheese in the fall. All the Southern tier of counties in that State are largely embarking in it. The Census of 1835 gives the quantity made in the State at 36,000,000 lbs. Ohio has doubled her exports of it within five years. Indiana cheese is now becoming known in the market.

As a sample of its increase, we give the following statistics of the amount that arrived at tide-water on the Hudson River, from the Canal Collector's books:

Year.	Pounds.	Exported.
1834	6,340,000	
1835	9,586,000	
1836	14,060.000	
1837	15,560,000	
1838	13,810,000	
1839	14,530,000	
1840	18,820,000	723,713
1841	14,170,000	1,748,781
1842	19,004,000	2,456,677
1843	24.334,000	3,440,144
1844	26,672,500	7,433,145
1845	29,371,000	7,941,187
1846	34,812,513	8,675,390

Here is a large quantity, but a ready market is found. The increase of foreign exports is large. Up to last fall the duty on it in England was $2 42 per 100 lbs. Sir Robert Peel's new Tariff reduced it to $1 per 100,

which will cheapen it to British consumers. The prices range in Liverpool, according to quality, from $10 to $15 per 112 lbs., and for three years past the London market has never been overstocked but three or four times, which has lasted but two to five weeks. It is getting introduced into all circles, and driving the Dutch article out of market. Mr. Colman, in his Agricultural Tour in Europe, says he found it gracing the tables of the lords and nobles, where, five years ago, it had never found its way. He dined with a Marquis, who treated him to American cheese, American apples, American cranberries, and American cider in bottles.

It is now exported to the East Indies in boxes; found in Calcutta, and goes; with other notions, to the Celestials of China. None but the real skim-milk grindstones, however, can stand a hot climate.

How many millions of pounds would come pouring down from the rich mountain sides and valleys of fertile and temperate *Western Virginia*, if penetrated with railroads, as New-England is! Only look at the difference, and if there be a spark of State pride animating the bosoms of the deseendants of the Marshalls, and Jeffersons. and Henrys, and Lees, let them look into the causes that are holding back that glorious Old Dominion, in the race that is pending between the Sisters of the Republic, "as if her legs were tied," and promising to bring her to the pole dead beat, and not even a third-rater. In Massachusetts, chiefly, and the adjoining States, there have been made, while Virginia *has been talking*, 851 miles of railroad, at a cost of $35,902,355; and, be it noted, of the finished parts of these roads, 662 miles pay a net profit of *over six per cent!*

A NEW BOOK, AND ONE MUCH WANTED.

A Manual of the Principles and Practice of Road-Making; comprising the Location, Construction, and Improvement of Roads, (Common, MacAdam, Paved, Plank, etc.,) and Railroads. By W. M. Gillespie, A. M. C. E., Professor of Civil Engineering in Union College.

The work of which we have here given the title, has made its appearance very opportunely, as it was much needed for the very reasons given in the Preface:

"*The common roads of the United States are inferior to those of any other civilized country.* Their faults are those of direction, of slopes, of shape, of surface, and generally of deficiency in all the attributes of good roads. Some of these defects are indeed the unavoidable results of the scantiness of capital and of labor in a new country, but most of them arise from an ignorance either of the true principles of road-making, or of the advantages of putting these principles into practice. They may therefore be removed by a more general diffusion of scientific instruction upon this subject, and to assist in bringing about this consummation is the object of the present volume. In it the author has endeavored to combine, in a systematic and symmetrical form, the results of an engineering experience in all parts of the United States, and of an examination of the great roads of Europe, with a careful digestion of all accessible authorities, an important portion of the matter having never before appeared in English."

We gave an extract from it in a former number,* and have only now to reiterate, what we have so often urged, that these are the subjects which ought to be taught in our Common Schools, as practical exemplifications of the Mathematics which in some of them are now taught or pretended to be. How obviously does a thorough reform in the course of Common School education, lie at the bottom of all rational ideas of the improvement and prosperity of the agricultural class! The *elements* of Agriculture—the same in all countries and all climates, have been so simplified as to be teachable and comprehensible to boys from twelve to sixteen years; and of these elements there ought to be a strong infusion in every course of rural education.

We are happy to have it in our power to say that a book is now in the press, exceedingly well adapted to this end, and which will commend itself to every teacher and every learner in the United States. It has the highest sanction, and is of universal applicability, and will be so very cheap—not exceeding 37½ cents—as to make the price of no moment.

Cork Bee-Hives.—Bee-hives have lately been made of cork, and have been found so serviceable that a considerable quantity of cork has been imported from London, for the purpose of making them.

Flower-Clock.—Linnæus formed, at Upsan, a flower-clock, the flowers of which indicated the hours by their different times of falling asleep.

* This article was written long since, and overlooked.

HOUSEWIFE'S DEPARTMENT.

KITCHEN GARDEN CALENDAR—*April.*—If the season is propitious, the gardener should now be active, and prepare his grounds for planting and sowing the more hardy vegetables—there is advantage in early cropping in light soils, transplanted plants root more readily, and seeds vegetate with greater certainty, especially in dry seasons. On heavy land we can hardly recommend hasty action; if the soil be prematurely worked, it is apt to retain traces of it, and remain stubborn throughout the season; it is therefore better to defer labor on such soils until it is sufficiently dry to crumble: if all is favorable, we may proceed as follows:

Alexanders, sow. *Angelica*, sow. *Artichokes*, plant or dress. *Asparagus*, sow, plant, force, and dress beds. *Balm*, plant. *Basil*, sow. *Beans*, sow, hoe. *Beets*, sow. *Borecole*, sow, prick out, leave for seed. *Broccoli*, sow. *Borage*, sow. *Burnets*, sow and plant. *Cabbages*, sow, plant. *Capsicum*, sow. *Cardoons*, sow. *Carraway*, sow. *Carrots*, sow, weed. *Cauliflowers*, late, sow in open ground. *Celery*, sow, leave for seed. *Chamomile*, plant. *Chives*, plant. *Chervel*, sow, leave for seed. *Coleworts*, plant. *Clary*, sow. *Cress*, sow. *Cucumbers*, sow. *Dill*, sow. *Earthing-up*, attend to. *Fennel*, sow or plant. *Finochio*, sow. *Garlic*, plant. *Horse-radish*, plant. *Hot-beds*, make and attend. *Hyssop*, sow, plant. *Jerusalem Artichokes*, plant. *Kale* (Sea,) sow and plant, dress beds. *Kidney beans* (dwarfs,) sow; (runners,) sow. *Lavender*, plant. *Leeks*, sow, leave for seed. *Lettuces*, sow weekly, plant from frames. *Marigolds*, sow. *Marjoram*, sow and plant. *Melons*, sow. *Mustard* and *Cress*, sow, leave for seed. *Mushroom beds*, make, attend to. *Mint*, plant. *Nasturtiums*, sow. *Onions*, sow, weed, plant and leave for seed. *Parsley*, sow, leave for seed, (Hamburgh,) sow. *Parsnips*, sow, hand-weed. *Peas*, sow, hoe, stick. *Pennyroyal*, plant. *Pumpkins*, sow. *Potatoes*, plant, attend forcing. *Purslane*, sow. *Radishes*, sow, thin. *Rape*, sow. *Rocambole*, plant. *Rue*, plant. *Salsify* and *Savory*, sow. *Scorzonera* and *Skirrets*, sow. *Shallots* and *Sage*, plant. *Sorrels*, sow and plant. *Spinach*, sow, thin, leave for seed. *Tansy* and *Tarragon*, plant. *Thyme*, sow and plant. *Tomatoes*, sow. *Turnips*, sow, plant and for seed. *Turnip-Cabbages*, sow. *Wormwoods*, sow.

In the Carolinas and Southward, plant beans, sow some peas in order to have an uninterrupted succession—spring-sown cabbage will now be fit to transplant—manure well if you expect fine heads; the plants set out in February and March will require culture, deep tillage is demanded by the cabbage tribe—about the middle or latter end of this month sow drumhead, flat Dutch and drumhead Savoy cabbage-seed for plants, to be set out in June—cauliflowers and broccoli may be sown. The carrots, parsnips, beets, &c., previously sown are now advancing in growth and should receive the necessary care; each of the roots named may now be sown—small onions set out in autumn and winter will shortly be fit for use—sow leeks for winter use; turnips sown last month should be hoed and thinned—asparagus is now in season, hoe over the beds to exterminate the weeds, the few heads which will be cut off are of no account compared with the good service of the hoe; draw up earth to the potato vines—sow radishes, the white summer and yellow turnips are the best for this season; lettuce may be transplanted, or drilled where intended to head; sow celery—plant more cucumbers and melons, also squashes—also okra, if not already in. The vigilant gardener will keep his eye upon the weeds—an hour's work now will equal a day's when the ground gets foul.

GREEN-HOUSE CALENDAR—*April.*—*Air*, admit daily as weather permits. *Camellias*, sow and graft. *Earth* in pots stir frequently; and add fresh if not done in March. *Greenfly* or *Aphis* usually indicates the house has been kept too cold. *Hardiest Plants* keep in coldest parts of house, near the ventilators. *Head down* irregular growing shrubs. *Heat*, increase if necessary. *In-arch* shrubby exotics. *Leaves* and *Wood* decayed, remove as they appear; clean with sponge or syringe. *Liquid Manure* apply to sickly shrubs. *Potted Plants*, shift as they require room; and water immediately. *Propagate* by seeds, cuttings, in-arching, and other modes, as the species permit. *Prune* or *pinch off* free growing shoots, to make shrubby growths. *Succulent* plants shift; plant cuttings and suckers. *Water* often, guided always by the plant's habits.

FLOWER GARDEN CALENDAR—*April.*—*Annuals* (Tender), prick out those sown in February and March into a hot-bed, water often. sow in hot-bed; (Hardy), may be sown in borders, &c., to remain; thin those advancing. *Auriculas* in bloom, shelter. (See *Hyacinth*). Supply with water often; those for seed, plunge pots in a sheltered border, where they can have sun until eleven o'clock, plant offsets, propagate by slips, seedling shade during mid-day. *Anemones* and *Auriculas* done flowering, take up and separate offsets. *Box* edging may be made, and old taken up, slipped and replanted. *Biennials*, finish sowing; plant out those sown last spring. *Bulbs*, in water glasses, done flowering, plant in ground after cutting down stalks: autumn flowering, take up and store, ready for planting in July; spring flowering, remove from borders to some place where they can complete their vegetation; their decayed leaves are unsightly. *Carnations* in pots give liquid manure, and water often, stir the earth; sow, plant into borders. *Climbing* plants, train and regulate. *Dahlias*, plant to remain, or in pots to forward in a frame until May. *Dress* the borders, &c., indefatigably. *Evergreens* plant; it is the best season. *Frames*, raise, by supporters at the bottom, as the plants within grow tall. Roll, trim edges, dress with earth if poor. *Gravel*, turn and lay afresh in dry weather, roll once a week. *Hyacinths*, shelter from

sun by an awning or matting over the beds, from nine to four; give the same shelter in bad weather day and night; those done flowering, take up; separate offsets and store. *Insects* destroy with tobacco smoke or dusting of Scotch snuff. *Magnonette*, sow in any warm border. *Mulch*, put round trees newly planted. *Pinks*, sow. *Polyanthuses*, sow, plant out and propagate by offsets; last year's seedlings now in bloom, mark best for propagating. *Potted Plants*, give fresh earth to, if not done last month; shift into larger; water freely. *Perennials*, those sown last spring may still be planted, and propagated by offsets; finish sowing. *Sticks*, are required to blooming plants. *Tulips*, take off pods to strengthen bulbs. *Watering* plants in pots is now required more frequently, yet moderately; give it early in the morning.

VEGETABLE LIFE—[By F. P. NICHOLS.]—Vegetable, like animal life, is derived from parental germination; it grows up to a state of maturity through the medium of nutrition; it sinks and declines from the exhaustion of its organization, occasioned by old age, and death ensues; the materials of its composition then decay and dissolve into their ultimate elements—thus leaving a vacancy upon the earth, to be filled up by the progeny of which it, in its turn, has become the author.

Vegetation commences its existence in a state of embryo, surrounded by a pulpy or fluid substance, upon which it is nourished, and contained in a tough skin; in this condition it is called seed. As soon as it becomes sufficiently strong to adapt the crude nourishment of the soil to its system, it grows ripe; and then, bursting from the case that has enveloped it, and by which it has been united to its parent tree, it is scattered about—in some cases carried by the wind to a considerable distance, in others projected by the elasticity of the seed-case; and in various other natural ways it is distributed upon the face of the earth, which it covers with the means of vegetation wherever sustenance has been supplied for its support.

As soon as the seed is deposited on a nutritive soil, it commences nourishing its enclosed germ, by absorbing the carbon of the surrounding air, and sucking up the fluids of the earth; thus strengthening and enlarging the tender plant, until, breaking through its covering, it sends forth two stems—one down into the soil, which throws out innumerable fibres, and is termed the *root*; the other, which is called the trunk, up toward the light, shooting forth branches, which in due season bear their appropriate leaves, flowers, &c.

The fibres of the root take up the food in the soil, and convey it in the form of *crude sap*, or undigested food, into the body of the root; from which it rises through the vessels of the trunk, undergoing all those various changes by which it is assimilated to a fit and proper nourishment whereon to support the existence of the plant.

The crude sap, thus deposited in the body of the root, is a compound of water and various earthy, saline, and gaseous matters: from the root it is impelled into the sap-vessels of the ascending trunk, where such agencies as light, heat, electricity, &c. acting upon it, it becomes decomposed, and deposits its various matters in a solidified form, in the various parts of the woody structure; it is now digested, and, dissolving the various matters it comes in contact with, rises up to the leaves, in order to receive the carbonic acid gas, which forms the vital ingredient of vegetable life, as oxygen does of animal: this is accomplished by the process of respiration. The sap being passed down a central vein of the leaf, is distributed through those innumerable minute vessels which form the network of that organ; there, by the action of the solar rays, a portion of the oxygen of the sap is given out, and the carbon of the air is absorbed in its stead; this only takes place during daylight; in darkness the reverse is the case—carbon is given out, and oxygen taken in.

The sap now, like the arterial or oxygenized blood of animals, becomes vital fluid, and returning along the branches, and down the trunk, is carried through the descending vessels to every part of the tree, repairing what is worn out, sustaining exhaustion, depositing the material of such new formations as the growth may require, and cleansing away all useless and obnoxious matter, which it carries down to the root, to be finally deposited in the soil.

Thus the vitality of vegetable life is dependent upon its organization, and hence subjected to the casualties of disease and accidental death. It may be starved by want of food; it may be poisoned by taking into its system noxious matter; it may be suffocated from want of air; its health may be impaired by breathing impurities; it may be invigorated by stimulants, and, in fact, is liable to all the vicissitudes of conscious nature. It performs its mission in replenishing the earth with verdure, fertilizing its soil, changing its inorganic substances into organic matter, purifying the atmosphere by absorbing the carbon by which it has been vitiated, and so, while yielding a fit nutriment to animal nature, rendering the earth a healthy habitation alike for man and beast. Such is the economy of vegetable existence. [Sharpe's London Magazine.

INFLUENCE OF MOTHERS ON THE LIVES AND HAPPINESS OF MEN—[By R. F. W. ALLSTON.]—If the great end of life be to prepare for a more exalted state of existence hereafter, the ends of knowledge should be to make men wiser, better, happier, and so to fit them for the society of the pure and perfect. To the gentler sex—to my fair countrywomen—belongs the pleasing and responsible task of laying the corner-stone, the groundwork of such preparation. It is at the mother's knee, in the homely nursery of childhood, that the earliest lessons are taught—they are among the last forgot. Dictated by natural affection, they are addressed to the heart and are indelibly impressed there. They are lessons of principle. No degree of talent can atone for the want of principle—no brilliancy of genius can compensate the want of virtue. True genius, indeed, in its nature, approaches the divine, is allied to virtue, and should always be associated with it. But for the errors and neglect which sometimes have obtained in *early education*, the world would not have to lament the sad fate of individuals possessing the highest qualities of mind, not directed, however, and not chastened by the holy principles of virtue.

The youthful man who treads the earth with firm, elastic step, approved by the aged, courted by the young, when tempted by his successful career to infringe the moral law, to yield to the

leadings of unbridled passion, is checked in the ardor of his temperament, for the first time, perhaps, by the timely recollection of her who with affectionate, mild voice, was wont to counsel her son, "Do unto others as you would have them do to you."

The man of years, broken in constitution and wasted with disease, while tottering on toward the last home of the wretched, stifles the rising murmur at his fate by the remembrance of the tested faith, the cheerful resignation and meek submission of a long lost mother.

Even the hardened criminal, when in his lonely cell he sighs for the home of his childhood, gives his first thought to the mother who endeared it. The man issoftened—he remembers! Whatever were her errors, whatever her conduct to others, she was always kind to him. The obdurate heart is subdued. He weeps bitter tears of contrition at his fall, and his voice is raised in accents, long unpracticed, to breathe forth the prayer which was taught him from her lips.

Cultivation of the Lettuce.—Mr. Forsyth gardener to the Earl of Shrewsbury, at Alton Towers, tells us that in that county boiled lettuce is a common dish, and recommends an improved mode of cultivation by which four crops a year shall be regularly secured. He says:

"Any lettuce will grow freely in the open garden after the 22d of March; in any rich garden-soil, four seeds in a square foot are sufficient; three crops in summer, off the same land, may be easily got, and if persons will go to the expense or trouble of transplanting lettuce, many crops may be had; and as four will grow upon a square foot, and weigh, when young, half a pound each, every square yard of soil will produce in the three crops in the season, half a cwt., which is 15 cwt. to the pole of ground, or 120 tons to the acre."

To Destroy Cockroaches.—If your correspondents will try the following simple plan, I will warrant them that every beetle and cockroach will shortly disappear, and that the kitchen will not again be infested. Add about a tea-spoonfull of powdered arsenic to about a table-spoonfull of mashed boiled potatoes; rub and mix them well together, and then crumble about a third of it, every night at bed-time, about the kitchen hearth; it will be eaten up or nearly so, by the following morning. The creature is very fond of potatoes, and devouring them greedily, crawls again into its hole and perishes. I had occasion to have some alterations made in the kitchen-stove six months after I pursued this plan, and found hundreds of wings and dried mummies of defunct cockroaches. Their disappearance was not attended with the slightest perceptible smell; and though five years have elapsed, not one has again been seen in my kitchen. In putting it into practice, any remaining crumbs should be swept up the next morning.

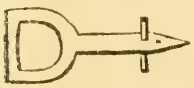
F. H. HORNER, M. D.

We have tried the foregoing, and found it perfectly effectual. [Downing's Horticulturist.

To Drive away Rats.—Mr. Charles Pierce, of Milton, recommends potash for this purpose. The rats troubled him very much, having eaten through the chamber floor; they appeared in great numbers, and were very troublesome, so that he felt justified to resort to stratagem and severe treatment for their expulsion from his premises. He pounded up potash and strewed around their holes, threw some under their holes, and rubbed some on the sides of the boards and under part, where they came through. The next night he heard a squealing among them, which we supposed was from the caustic nature of the potash that got among their hair, or on their bare feet. They disappeared, and he has not been troubled with them since that time, which was nearly a year ago. [Boston Cultivator.

Sparrows.—It is proved that a pair of sparrows, during the time they have their young to feed, destroy, on an average, every week three thousand three hundred and sixty caterpillars. This calculation is founded upon actual observation. Two parents have been known to carry to their nest forty caterpillars in an hour; and, supposing the sparrows to enter the nest only twelve times during each day, they would cause a consumption of four hundred and eighty caterpillars; this sum gives three thousand three hundred and sixty caterpillars extirpated weekly from a garden. But the utility of the birds is not limited to this circumstance alone, for they likewise feed their young with butterflies and other winged insects, each of which, if not destroyed in this manner, would become the parent of hundreds of caterpillars.

Preservative against Moths.—A small piece of paper or linen just moistened with turpentine, and put into the wardrobe or drawers for a single day, two or three times a year, is sufficient preservative against moths.



Dibber or Dibble.—This instrument for making holes in which to insert seeds or plants, is usually very simple in its construction, being at the best the head of an old spade handle. To secure uniformity of depth in planting beans, &c., by this instrument, it is useful to have it perforated with holes to receive an iron peg, at two and three inches from the point, as in the following outline. It should be shod with iron; for if this be kept bright it will make holes into which the soil will not crumble from the sides. The crumbling is induced by the soil's adhesion to the dibble. For planting potatoes a dibble with a head three inches diameter at the point, six inches long up to the foot-rest, and with a handle four feet long, is to be preferred. For the insertion of seed, a dibble that delivers the seed has been invented by a Mr. Smith.

☞ French beans, and some suppose the garden pea, Lima beans, &c., may be preserved for winter use by boiling them in corked bottles like gooseberries, for an hour or an hour and a half. Before using, they are to be scalded in water with a little salt. Celery may be preserved in the same way and requires only half an hour.

STANZAS.

"Why are we, like children, unwilling to go to bed?"
BISHOP HALL on "Death."

'Tis true, most true, as children shrink away
From the quick-coming nurse at close of day,
So from our last cold pillow fain would we
Draw back a little space, if it might be.
Why are we thus reluctant? Even as they
We dread the dark, we love the light of day.

The child will linger by his mother's knee,
The parting hour has banished all his glee;
That sweet, low song he longs again to hear,
To stay and watch the stars come, bright and clear;
It likes him not to quit the cheerful light
For the thick clouds and phantom form of night.

And even so to mother Earth we cling,
When Death unfolds his dark and gloomy wing;
For she is bright with flowers, and glad with birds,
And musical with tones of kindly words:
While all her sorrows in their dire array,
Seem now but shadows of a summer's day.

But the cold hands which beckon us to sleep
Unfold two worlds for meditation deep,
Make us behold the folly and the sin
That through long vanished years we gloried in,
And bid us look upon a Judge, whose eye
Is purer than to pass transgression by.

True, there is still one Sacrifice, one Rock,
One Shepherd watching o'er his weary flock;
But faith is weak, the heart with terror swells
As memory weaveth all its darkest spells:
Therefore, like frightened children, fain would we
Fly from our last rest, if it might be.

ELLEN C——.

PRICES CURRENT.

[*Corrected, March 29, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47-8 ℔ 100 lb	5 75	@—	—
Pearls, 1st sort, '47-8	7 50	@—	—
BEESWAX—American Yellow	— 22½	@—	23½
CANDLES—Mould, Tallow..℔ lb	— 12	@—	14
Sperm	— 32	@—	33
COTTON—From ℔ lb.	— 6½	@—	8½
COTTON BAGGING—Kentucky	— 15½	@—	16
CORDAGE—American ℔ lb.	— 11	@—	12
DOMESTIC GOODS—Shirtings, ℔ y.	— 4½	@—	9
Sheetings	— 6	@—	15
FEATHERS—American, live	— 35	@—	37½
FLAX—American	— —	@—	9
FLOUR & MEAL—Genesee, pure, bbl.	6 62½	@—	—
Genesee, from Western Wheat	6 50	@ 6	56½
Troy	6 50	@ 6	56½
Oswego	6 50	@ 6	56½
Michigan	6 62½	@—	—
Ohio	6 50	@ 6	56½
Brooklyn and New-York	6 50	@—	—
Brandywine	6 50	@—	—
Georgetown	6 37½	@ 6	50
Baltimore, Howard-street	6 37½	@—	—
Richmond City Mills	— —	@—	—
Richmond Country	6 37½	@—	—
Alexandria	6 37½	@—	—
Fredericksburg and Petersburg	6 37½	@ 6	62½
Rye Flour	3 62½	@ 3	81½
Corn Meal, Western and State	2 37½	@—	—
Corn Meal, Jersey	2 43¾	@ 2	50
GRAIN—Wheat, White ℔ bush.	— —	@ 1	50
Wheat, Red and mixed	1 37½	@ 1	42
Rye, Northern	— —	@—	75
Corn, Jersey and Northern yel	— 52	@—	53
Corn, Southern, white	— 54	@—	56
Corn, Western, flat yellow	— —	@—	—
Oats, Northern	— 43	@—	48
Oats, Jersey	— 38	@—	40
HAY—North River in bales, ℔ 100 lb	— 56	@—	62½
HEMP—American, dew-rotted.. ton	135	@140	—
" " water-rotted	160	@190	—
HOPS—1847	— 6½	@—	7½
IRON—American Pig, No. 1	30	@32	50
" Common	28	@29	—
LIME—Thomaston ℔ bbl.	— 75	@—	78
LUMBER—Boards, N.R., ℔ M. ft. clr.	35	@	40—
Boards, Albany Pine ℔ pce.	— 10	@—	19
Plank, Georgia Y. Pine. ℔ M. ft	27 50	@30	—
Staves, White Oak, pipe. ℔ M	60	@—	—
Staves, White Oak, hhd	45	@—	—
Staves, White Oak, bbl	33	@35	—
Staves, Red Oak, hhd	28	@32	—
Hoops	27	@32	—
Scantling, Eastern	17 50	@20	—
Scantling, Oak	30	@35	—
Timber, Oak ℔ cubic foot	— 22	@—	25
Timber, White Pine	— 18	@—	22
Timber, Georgia Yellow Pine	— 30	@—	35
Shingles ℔ bunch	2 50	@ 2	75
Shingles, Cedar, 3 feet, 1st quality.	28	@34	—
Shingles, Cedar, 3 feet, 2d quality.	27	@32	50
Shingles, Cedar, 2 feet, 1st quality.	20	@25	—
Shingles, Cedar, 2 feet, 2d quality.	18	@22	—
Shingles, Cypress, 2 feet	18	@22	—
Shingles, Company	35	@38	—
NAILS—Wrought, 6d to 20d ℔ lb.	— 8	@—	13
Cut 4d to 40d	—	4½@—	4¾
PLASTER PARIS—℔ ton	2 50	@—	—
PROVISIONS—Beef, Mess, ℔ bbl	8	@ 8	75
Beef, Prime	5	@ 5	75
Pork, Mess, Ohio, old	—	@—	—
Pork, Mess, Ohio, new	10 25	@—	—
Pork, Prime, Ohio, old	8 75	@ 8	87½
Pork, Prime, Ohio, new	9 25	@—	—
Lard, Ohio, prime new ℔ lb.	— 7	@—	8½
Hams, Pickled	— 6½	@—	7
Hams, Smoked	— 7¾	@—	9
Shoulders, Pickled	— 4	@—	4½
Beef Hams in Pickle	10 —	@11	25
Beef, Smoked ℔ lb.	— 6½	@—	6½
Butter, Orange County Dairy	— 21	@—	23
Butter, Western Dairy	— 16	@—	18
Cheese	— 6½	@—	7½
SEEDS—Clover, new ℔ lb.	— 7	@—	7½
Timothy ℔ tierce	18 —	@21	—
Flax, Rough, in bulk bush	1 37½	@—	—
SOAP—New-York ℔ lb.	— 4	@—	7
TALLOW—American Rendered	— 9½	@—	9¾
TOBACCO—Virginia @ lb.	— 3	@—	7
Kentucky and Missouri	— 3¾	@—	7½
WOOL—Am. Saxony, Fleece, ℔ lb.	— 42	@—	47
American Full Blood Merino	— 38	@—	40
American ½ and ¾ Merino	— 33	@—	36
American Native and ¼ Merino	— 28	@—	30
Superfine, Pulled, Country	— 31	@—	33

Marshall P. Wilder

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MARSHALL P. WILDER,

PRESIDENT OF THE MASSACHUSETTS HORTICULTURAL SOCIETY.

If there is any one class of citizens which deserves at the present moment especially the respect and admiration of their countrymen, it is, perhaps, the merchants of Boston.

To indomitable energy and enterprise, in acquiring wealth, they add a spirit of wisdom and philanthropy, and a faith in the progress of Man in the use of it, which at once does honor to the city in which they live, and raises the character of commercial pursuits more than all the honors of knighthood.

It would be making too long a catalogue were we to enumerate even the most conspicuous public benefits which Massachusetts has derived from this intelligent and high-minded class of her sons. Numberless public charities have been founded and supported: public and free schools planned and sustained; lectures given to the public; new worlds of thought opened to the blind; the deaf and dumb brought into correspondence with their fellow men; poor artists sent abroad to develop their Heaven-bestowed talents; colleges richly endowed, and a great Scientific School opened cheaply to every citizen of the Commonwealth for instruction in sciences applicable to all the useful industries of life.

This, and much more, has been done by a liberal application of the wealth produced by their own industry, by the merchants of Boston. It would be a pleasing task to designate those who have thus most successfully proved that they understand the true uses and true obligations of wealth. But we are obliged at this moment to confine ourselves to a single illustration of the benefits which a merchant, engrossed with business, may confer on his countrymen, when actuated by this large spirit of usefulness to his race.

Pearl-street, in Boston, completely rebuilt within a few years, presents to the eye two continuous lines of fine warehouses—beautifully and fittingly built, in an appropriate architectural style, of neatly-dressed granite. Enter with us one of these stores at the beginning of the street; ascend into spacious apartments where on every side are seen boxes and bales filled with the productions of the active looms of New-England; pass through counting-rooms where various clerks poring over huge ledgers tell of a widely extended business; and finally penetrate to a third office. In this inner vestibule of the house of trade, sits, before a desk covered with a large correspondence, a merchant thoroughly devóted to his calling. In his countenance you see only the engrossing cares of Commerce, and his ample

brow and clear, penetrating eye are full of plans for the increase of cotton-mills and American manufactured goods, of better quality, and lower price, than John Bull can possibly send into our market.

About four miles south of Boston is the town of Dorchester—one of those agreeable rural suburbs of Boston, which the sturdy city, now full of robust health, is fast overtaking and swallowing up with its vast commercial appetite. In a part of this town is situated a rural residence—well known as Hawthorn Grove. If we enter the gates of this simple and unpretending place, about sunrise or sunset, we shall find there not only grounds which are a complete museum of Horticulture, full of every known variety of fruit-tree; orchards well planted; and long, fruitful alleys: but, also, the same merchant we saw in the inner counting room in Pearl-street. The same? yes! the same to the common observer, doubtless; that is to say, the gentleman whose portrait illustrates this number of THE FARMERS' LIBRARY; but not now the busy, engrossed merchant—only the zealous, enthusiastic *Horticulturist*—the President of the Massachusetts Horticultural Society—the experienced pomologist—the importer of, and anxious seeker after all new fruits and plants; in short, MARSHALL P. WILDER—the subject of the present notice.

We are not about to write the life of Col. Wilder. We hope it may be many long years, filled, like the present, with usefulness, before he needs a biographer. It is our more agreeable task, at the present moment, to glance hastily upon the field of labors in which his name has become a public one, and in which it is especially interesting to the readers of this journal—as a horticulturist.

It is sufficient, then, to say that Col. Wilder is a native of New-Hampshire, the Granite State, which boasts, not without reason, that "*men* are the fairest product of her soil." He was born in the town of Rindge, N. H., in September, 1798, where his devotion to his garden and to mercantile life awakened along with each other. For more than twenty years he has been one of the most industrious and successful merchants of Boston, and for sixteen years he has employed every moment of *forced* leisure—leisure borrowed, not from business, but from the ordinary relaxations of the business man, in carrying out his favorite study of Horticulture.

In a city most conspicuous among all American cities for its horticultural amateurs, Col. Wilder has long been known as one of the most zealous and the most active devotees of this science. For eight years past he has been annually elected President of the Massachusetts Horticultural Society—first of all institutions of the kind in the Union for its large activity, intelligence, and usefulness. During his administration, the number of Members and the funds of the Society have been greatly increased, its new Hall erected, at a cost of $40,000, and a very richly illustrated series of its *Transactions* commenced.

But this is to us, and to the country at large, not the most important and valuable view of his great services as a scientific cultivator of the soil. There are, perhaps, many men's grounds more attractive, or more captivating to the novice, than those of the President of the Horticultural Society. But we think we may safely say that no garden in America, either public or private, has been more fruitful in good experiences for the benefit of the art generally, and especially of Pomology, than that of Hawthorn Grove.

Let us say a word or two to make this plainer to the general reader. Horticulture has been so much perfected in the last thirty years that it may be said

to be not only a science of considerable breadth, but an art involving in its materials ten thousand details. In all parts of Europe and America, new fruits, plants, and trees, are continually brought into existence by the creative hand of the skillful gardener. Especially at one period, about fifteen years ago, did the Flemish cultivators astonish the world of fruit-growers with their catalogues of superlative new fruits. Now the natural vanity of some, and the natural ignorance of other cultivators, lead them to overrate the merits of many new varieties. Difference of soil and climate also renders a fruit of the highest value in one country of lesser or greater value in another. Behold, then, how important that some steps should be taken by which all this vast mass of accumulated material should be put into the crucible of knowledge from time to time, so that the pure gold should be separated from the dross, for the benefit of a whole community of men who have good orchards and gardens!

In other countries, Societies or Governments, with abundant means at their command, have undertaken this Herculean task of collecting and proving new fruits and plants. But, in this country, no Society has as yet been able, no one of the States willing, to prosecute this interesting and necessary series of experiments. But what the Horticultural Society of London has done for England in the way of fruits, or the *Jardin des Plantes* for France, in trees and plants, Col. Wilder has to a very considerable extent done for New-England (and we may indeed say for the Union) in his own private grounds at Hawthorn Grove.

To accomplish this object he has long pursued the following plan:

1st. Entering into active correspondence and maintaining standing orders with all the most eminent horticultural amateurs and nurserymen of foreign countries, and procuring at the earliest moment every new production worthy of note, abroad as well as at home. This has necessarily given his grounds, at all times, the aspect of a crowded museum of gardening novelties from all parts of the world, more attractive to the understanding of the connaisseur than to the eye of the tyro.

2d. Continually testing these new fruits and plants by putting them in proper sites and soils, keeping an accurate record of all results, exhibiting all his specimens before the public at the exhibition of the Horticultural Society, and freely distributing scions, plants or seeds, to other persons.

3d. Producing new varieties by the scientific process of hybridizing*—several of which have been great acquisitions to the country.

As an experimental pomologist, we are inclined to give the subject of this notice higher praise than in any other department. He has that faculty of *just discrimination* so rare among *enthusiastic* collectors, which enables him to *reject and publicly excommunicate* a really inferior variety after thoroughly testing it; even if it should come to him with the highest reputation from abroad. "Take nothing on trust—prove for yourself, and hold fast to that which is good," such are the maxims which govern his experimental practice in his favorite art. We have indeed heard him remark to a friend, who expressed his surprise at his patience in collecting so many varieties of fruits, to find only so small a number really worthy of general cultivation, that such was his desire to get at the truth that "his satisfaction in ascertaining that a variety was poor (thus preventing its extensive dissemination) was nearly as great as in finding it worthy of general cultivation."

The *Pear* has perhaps been Col. Wilder's favorite fruit, and he has been re-

* A very able article on the curious and interesting subject of *Hybridization*, from the pen of Col. Wilder, will be found in the 2d Part of the "Transactions of the Massachusetts Horticultural Society."

markably successful in its cultivation. Even upon the Quince stock some of his trees have borne a barrel in a season. He has exhibited one hundred and sixty varieties of this fruit at a single Show of the Massachusetts Society, and his garden now contains more than *five hundred sorts* of pears from all parts of the world, either in bearing or under cultivation for proving their value for the American soil and climate.

Among exotic plants the *Camellia* was long ago his favorite. His collection at one time embraced nearly three hundred sorts, comprising every novelty extant. Applying, with his usual success, hybridization to this genus of plants, he has been successful in producing two new varieties of surpassing beauty—not excelled by the most perfect productions of Europe.

The Massachusetts Horticultural Society two years ago voted him a special prize of silver plate for those beautiful acquisitions to the domains of Flora.*

Col. Wilder's devotion to Horticulture, his liberality in imparting information, however dearly bought, and in distributing seeds, plants, and scions to parts of the country where their value would be appreciated, or whence some excellent native production was offered in exchange, have made him known as a benefactor to those who live "amid gardens and green fields" in all parts of the Union.

We may remark, in conclusion, that it would be difficult to present to the contemplation of our readers an instance of an individual who so completely accomplishes all the laborious duties of a life of large mercantile pursuits, and yet who at the same time makes his few hours of leisure, each day, tell so emphatically for his own happiness, and the benefit of his fellow cultivators of the soil, in all parts of the country. It is only indeed by making Horticulture the *great working pastime* of his life, that he has been able to accomplish so much. But can one hold up a better example to the emulation of those citizens who find nothing to do in the country, and no occupation there, worthy of engaging their energies and their industriously accumulated fortunes?

For ourselves, we rejoice in the long-sought opportunity and means of presenting to our young readers, and to gentlemen of opulence and leisure, even this brief sketch of what has been done by a single citizen, to investigate the merits and perfect the properties of our flowers and fruits; much as it falls short of giving a full idea of his contributions to an elegant and intellectual pursuit—one that at once denotes, accelerates and adorns in all countries, the progress of civilization. Nor can the full measure of honor due to such citizens as Col. Wilder and his associates, for the strong lead they have taken, as well in the science as in the practice of Horticulture, be properly estimated without making large allowance for the rigors of the climate with which they have had to contend. In more genial regions, Nature scatters profusely her beautiful creations, with open hand—without waiting for Art to assist, or Industry to serve her—while in the North, she yields them only, if not reluctantly, to the most skillful and assiduous importunities. But to these she does give them in such variety and richness, as none can appreciate who have not witnessed an exhibition of the Society over which Col. Wilder presides. Well do we remember when, on our first entrance into Hawthorn Grove,

> "The perfumed air
> Gave another sense, its prelude rich
> Of what the eye should feast."

* These two Camellias were named by the Society, C. Wilderii and C. Mrs. Wilder. We may give our farming readers some idea of the commercial value of new and rare plants, by remarking that the stock of these two varieties was purchased of a nurseryman for $1,000, who immediately went to Europe, where, we learn, he disposed of them by subscription, at *ten guineas* the pair.

Since that time, always—and we may say habitually—holding in high comparative estimation the beauty and the usefulness of lives and labors thus devoted to peaceful and meliorating pursuits, we have been anxious, in a sense of duty, and for the good of Society, (least of all for his own sake) to pay to the proprietor the very inadequate homage which here we render.

For the painting from which the engraving has been made, we are indebted to the artist, Mr. Marchant of this City, in whose collection it still remains—a true presentment of the estimable original, as far as Art can supply one. The engraving, as will be seen, is by Mr. Jackman, and does him credit as a worker in that, one of the finest among the Fine Arts.

EXPERIMENTS IN CULTIVATION AND MANURES.

THICK AND THIN SOWING—DRILL AND BROADCAST HUSBANDRY—EFFECT OF CERTAIN MANURES—ALL COMPARED.

The English agricultural journals are throwing a vast flood of light on practical Agriculture, and we endeavor to give the brightest of it applicable to the United States. The fact is that the condition of English Agriculture is such as to compel the most skillful application of the greatest force both of talent and capital, that can be brought to bear upon it. Hence it invokes and commands the services of the ablest men in the Kingdom—men most versed in all the laws of Nature that apply to agricultural production. But these men, with equal judgment and good sense, all demand from the practical farmer a full knowledge of *reliable facts;* and to these they apply the principles of Science, and draw deductions on which the practical farmer may thenceforth rely and proceed. Such is the present state of Agriculture in Europe, and such the harmonious cooperation of Theory and Practice. Men in the field, making exact observations, and giving their facts; and men in the closet, reflecting on these facts the light of the torch of Science, and illustrating, to the apprehension of the plainest understanding, *how and why it must be so* and could not be otherwise—and by what means other and more propitious results may be obtained, where those have been heretofore unprofitable and disastrous to the hopes of the farmer. For example: the Farmer tells the man of Science—"On such a piece of land I had a heavy crop of roots, or grass, while on one very near, and richer, I had nothing worth cutting or storing." On inquiry, the man of Science finds that one piece of land drained itself, and retained no surplus moisture; while the other remained all the time more or less wet. Well, then he explains to the Farmer how water is a bad conductor of heat, while air is a good one; that if he will try he will find many degrees of difference in the temperature of the two pieces of land; and that if he will drain the wet piece, and draw off the particles of water that fill up the pores between the particles of earth, and let in *air* in place of them, it (the air) will at once convey manure to, or rather itself manure, the roots, and raise and improve the temperature of the land. The Farmer, however plain, can understand this. He drains the land according to the rules and with materials—*all* of which have been exhibited here in The Farmers' Library—and the next year he gets from his too moist land an additional crop that

more than pays all the expenses of the operation in one year, and leaves that very spot the most productive piece of land he has, in all time to come.

Such is what is being done for Agriculture by the harmonious "aid and comfort" that the scientific and the practical men are rendering to each other all over England and Scotland, under the spur of the most urgent necessity and by the force of immense capital; and, patrons of The Farmers' Library, the results of all this, which costs so much in England, and for detailed statements of some of which, in Prize Essays, hundreds of dollars are given—these results and these Essays we get by every steamer from England and France, and spread them all out before you for less than half a cent a page: one glass of poisonous alcohol, for which you pay $6\frac{1}{4}$ cents at the least, would pay for one of these Prize Essays, written by the first men living, in the various departments of Agricultural Science, machinery and mechanics, and paid for at the rate of from ten to sixty guineas—$50 to $300—under the award of the ablest and most practical men to be found in England. And yet there are those who would tell you that such knowledge is of no account, because, forsooth, there is, between England and some part of the United States, a *difference of climate!*—as if it took some privileged character, some wise man in his own conceit, to find that out.

Well, on this subject of climate, why do not Agricultural Societies offer premiums in the different States, to those who will keep and supply the most exact registers of meteorological observations—fall of rain and range of heat? Just because it would be going out of the common track—because they won't take the *trouble of thinking*, but content themselves with offering premiums for crops on perches of land, and great masses of fat on a frame of bones! Do not these Societies know the benefit which Agriculture might derive from a series of such observations in all the States? What are our Agricultural Committees of Legislative bodies about, that they don't take measures to secure such information for the use of the Farmer? Don't they know that the Government is spending hundreds of dollars to have such things done—exactly such—as connected with the Army—with War—those for which you, agriculturists, are taxed more than 80 per cent. of all you pay for the support of Government? Do you know that the People of the United States—the planters and farmers employed in the peaceful and civilizing pursuits of Agriculture—pay for our military establishments—Army and Navy—a *larger proportion* of the whole expenses of Government, than is paid for like purposes by any other people under the sun, unless it be, possibly, the serf-people of Russia, thousands of whom are bought, like cattle and sheep, along with the land! And for tame submission to such a vile prostitution of the ends of Government, and of taxes drawn from the products of your industry, do you not deserve the same fate? And, after all, until you dare complain, your Government will not, for agricultural uses, buy a thermometer, or set up a rain-gauge, or analyze a stalk of corn, or a pod of cotton, to save you from perdition, unless it were to see how far it might be made to take, cheaply, the place of *gunpowder!* Nor will your Representatives ever demand it to be done, as long as you have not the spirit to resist such iniquitous extortion. Eighty per cent. of all expenses for Army and Navy, ships and forts! It is impossible that a rational people can submit to it, situated as we are, unless it be that Almighty God, for some inscrutable purpose, has doomed them to be slaves—*Quem Deus vult perdere prius dementat.* Measures of Government provide for taking meteorological observations at all *military* posts, and on these the patriotic and philosophical inquirer must rely; but these are kept exclusively, as are such

posts, on the frontiers, and are necessarily deficient in supplying the information necessary for agricultural purposes and the general purposes of Science. Why should not the General Government, or, if not, the State Governments, pay to have such registers kept, at least at the Seat of Government in every State of the Union?

But to return to our subject: what follows may give some idea of what is doing in England, in the way of scientific information and practical experiment.—Thick or thin sowing is one of the engrossing topics, now, in foreign agricultural journals. We shall, once for all, give what follows. Our readers need not dread being overdosed, in this journal, about anything. When we see what seems to be new and useful, we shall give it, and be as soon as possible *done with that topic.* Every man of common sense can see (and we choose to anticipate the objection) that where so much is communicated there will be many things not exactly applicable to our country. But have we so poor an opinion of our readers as to suppose that they cannot discriminate as well as read?—What we should regard as strong *prima facie* evidence in favor of drill-sowing wheat is the persuasion that it is strongly advocated by such a farmer as Major JONES, of Delaware—a man who looks with his own eyes, and thinks with his own head, on all agricultural matters.

From the London Agricultural Gazette.

We are sure that our readers must agree with us in the high value to be placed upon the annual statements of his AGRICULTURAL EXPERIENCE which the Hon. and Rev. L. VERNON HARCOURT has published in our columns. Nothing can be truer than his first sentence in the adjoining page: "Facts, and not theories or opinions, are the things most wanted for the improvement of Agriculture." And nothing can exceed the faithfulness with which in the full details that follow he has adhered to this doctrine as the guide of his proceedings. Whether the subject be the merits and demerits of hedge-row timber—the relative advantages of sowing broadcast and in rows—the benefits of hoeing grain crops during their growth—or the much debated question of thick or thin seeding—it is not an opinion or a dogma that he insists upon, it is the simple record of his experience that he recites. How very few agricultural writers there are who, on most of the above-named subjects, would think it worth their while to refer to facts in proof of their teaching—they would assert the *self-evident* truth or argue from the *obvious* advantages, and so forth; but who would think of patiently observing and recording experience on points so "certain!" And yet this is the only true philosophy: to found a doctrine upon facts is the only safe method of teaching.

And if this be true of what are called "settled" questions, how much more of those which are still debatable! The question of THICK OR THIN SEEDING, for instance; we shall never arrive at any certain conclusion upon it so long as the disputants having stated all they *know*, prolong discussion on the character of their opponents rather than on that of their evidence. Some of these gentlemen exhibit a very suspicious preference of adjectives to substantives in their writings; this may be taken as a very safe indication of their approaching exhaustion. How easily and satisfactorily, on the other hand, the matter could be resolved if intelligent farmers—those who can give their own experience upon it—would simply state it, and thus conclude the discussion instead of leaving it in the hands of the few who have hitherto conducted it. Let Mr. Wilkins's experience, that of Mr. H. Davis, of Mr. Mechi, and of hundreds of others, be thus tabulated and compared, and we should have a sufficient basis of facts on which to rear a sound conclusion—but so long as farmers hear of three or four witnesses merely, and those asserting an experience acquired only on highly cultivated land, they will be justly fearful of sanctioning that general adoption of thin sowing which is recommended.

Our own opinion is simply this—that to grow a good crop of wheat many conditions must concur; *one* of these, and *not* the most important, being the right relationship between the number of plants on a given space and the means which that space (of air as well as land) has of maintaining them. There is a possibility of too few being grown as well as of too many; in the one case the greater size of the ears of corn does not compensate for this smaller number, and the whole plant later of ripening is more liable to disease; in the other, the number of ears does not compensate for their puny size, and the plants being crowded have short and weaker straw. There are, however, differences in grain produce, consequent on other causes, so great that we do not believe it to be much influenced by two or three pecks, more or less, of seed, between five and eight per acre: the former we believe, in ordinary circumstances, to be sufficient, and an additional quantity up to the latter is probably simply wasted, while beyond the latter it is probably

also injurious. All this may appear dogmatic, and to earnest advocates of thin seeding unreasonable; we can only say that for the last seven years we have sown from 60 to 120 acres of wheat per annum, with quantities varying from 27 lbs. of seed up to 10 pecks per acre, and our conclusions are, we think, rightly deducible from our experience.

There is no better illustration of the way in which this subject has been discussed than the reception experienced by "More Facts" in connection with it lately published in a tabular form by Mr. Baker, of Writtle, in the Mark-Lane Express. Two gentlemen noticed them on the following week. The one says: "I like Mr. Baker's quiet way of stating a fact; it is better than declamation;" and he very justly adds: "I hope, if he has any facts *in favor* of thin seeding, he will communicate them, and also the results of any of *his own experiments*, which I presume he has tried. I shall consider it my duty to publish all the facts I am cognizant of, either for or against, and I hope other agriculturists will do the same. We ought not to appear as mere *advocates* of a particular system, but as judges of facts sought for or tried by ourselves."

He then follows with a number of facts within his own knowledge as to the practice of farmers in his neighborhood, which we shall publish as so much clear addition to the history of the subject:

"Last year, Mr. Walker, of Petistree, Suffolk, a successful practical farmer, tried thin seeding, in consequence of my remarks at a previous meeting. In the middle of a fifteen-acre field he altered the drill-wheel, and deposited 1 bushel of seed on 1 acre, the rest of the field having his usual quantity, 2 bushels; it was sown in October. The thin-sown acre produced 7 bushels more per acre than the thicker sown acre, besides saving the bushel of seed. In another field, drilled in November, (a month later,) he had no increase from thin sowing, but saved his bushel of seed per acre, and grew a greater WEIGHT of straw, which confirms my own experiments, that we get more *weight* of straw from thin sowing than from thick. My own experiments for three years have been *invariably* in favor of 1 bushel per acre over 2 bushels—the saving being often the rent of the land. I have now 50 acres drilled with 1 bushel per acre, and 32 acres sown later with 5½ pecks. Mr. W. Hutley has, at Wigborough, 130 acres of wheat drilled with 5 pecks per acre. Mr. James Wood, of Goldhanger, grew as much from 1 bushel as from 2."

The other gentleman finds in Mr. Baker's "facts," arguments than which "nothing could have been more convincing in favor of thin sowing;" he adds no new facts himself, and welcomes these only because in *his* eyes they are in favor of what he considers a better system of Agriculture. Now, what we have all along contended for is that facts are welcome, whatever the tale they tell. What we want is TRUTH, not evidence in favor of any particular creed. We ough gladly to receive evidence of all sorts from trustworthy witnesses, and then we should admit its obvious testimony. But how does the correspondent of the Mark-Lane Express approach Mr. Baker's facts? By a singular and amusing ingenuity, he grounds his conclusions on a comparison of the best account of the thin seeding with the worst of the thick, and is silent regarding all the others on the scale between. It is as if, of all the fields on a farm, of various fertility, each of which was half thick sown and half thin, he had taken the characteristic acreable produce of the former from the worst, and that of the latter from the best of the series.

But he illustrates his point in another way. He shows by the plainest arithmetic that the produce of the thin sown was a greater multiple of its seed than that of the thick sown. This he appears to think is a great point. Now, so far from this, we submit that, excepting in a country where land is of no value, the inference he draws is absolutely worthless. It is the produce per *acre*, not per bushel of seed, that the farmer looks to. We have grown 30 bushels per acre from 1½ pecks, and 50 bushels per acre from 8 pecks of seed; in the former case we obtained 80, and in the latter only 25 fold the seed, but on which had we the most reason for self-gratulation?

We subjoin the whole letter:

"As every additional fact in favor of a better system of Agriculture must be interesting to a thinking public, will you allow me publicly to thank Mr. Baker for his "More Facts on Thin Sowing," which you published in your Express of December 31. An article so much in favor of thin sowing from the captain of the influential troop of agricultural protectionists must have great weight with the agriculturists of Essex, and perhaps so with all England. Mr. Baker's facts are as follows:

5 pecks sown produced 3 bushels and 3½ pecks.
7 pecks sown produced 5 bushels and 2 pecks.
5 pecks sown produced 7 bushels. And
8 pecks produced 9 bushels and 2 pecks.

That is to say—

5 pecks produced 15½ pecks, or 1 peck produced 3 1 10 fold.
7 pecks produced 22 pecks, or 1 peck produced 3 1-7 fold.
5 pecks produced 28 pecks, or 1 peck produced 5 3-5 fold.
8 pecks produced 38 pecks, or 1 peck produced 4 6-8 fold.

"By the above analysis it is clearly shown that the experiments do furnish more facts on thin sowing, since one of the smallest quantities of seed produced the largest increase of crop; the 5 pecks produced 28 pecks, while 7 pecks produced only 22 pecks. Nothing, therefore, could have been more convincing in favor of thin sowing, or I would show Mr. Baker where by a little more than half 5 pecks of seed 75-fold was produced, and where only a little more than 5 pecks of seed produced a crop of nearly 63 bushels an acre. But the above 'More Facts on Thin Sowing' are enough, and I thank Mr. Baker for publishing them."

We have not given the names of the writers of these letters (we cannot suppose that

they will care for that) because our object has not been to bring home anything to *them*, but simply to illustrate the general subject of agricultural instruction, of which Mr. Harcourt's paper following is so valuable a specimen.

EXPERIMENTS IN CULTIVATION AND MANURES.

Facts, and not theories or opinions, are the things most wanted now for the improvement of Agriculture. The latter are as plentiful as blackberries, the former are treated as if they were weeds not worth producing, and yet they contain the whole practical truth of the art, and the latter cannot be sound if they are constantly contradicted by them. I therefore persist in recording the results of my experiments as a contribution toward laying the foundation of more certain knowledge, and it is the more necessary because Agriculture is not an exact science, but is exposed to a thousand contingencies which perplex our investigations; and accidents of weather and variations of soil and the ravages of animals render accurate comparison extremely difficult. The object of these experiments in cultivation was to compare—1. Sowing broadcast with sowing by the drill. 2. Thin sowing with thick sowing. 3. Hoed crops with unhoed crops. The first experiment was made in five different places; but one of them, on account of the havoc committed by the wire-worm, was not a fair trial; of the remainder, two gave the following results, the calculation per acre being made from 6 perches measured and weighed:

	Corn per acre.		Straw per acre.		Weight per bush.
	Bushels.	Gallons.	Trusses.	Pounds.	Pounds.
1. Drilled wheat	36	5	87	14	60
Broadcast ditto	43	2	102	8	61
2. Drilled wheat	40	0	81	17	62
Broadcast ditto	41	5	89	22	62

The last of these I consider a perfectly fair trial: and the advantage is on the side of the broadcast, but it is an advantage which I hold to be more than compensated in favor of the drill by the superior economy and execution in keeping the land clean; with respect to the other I must observe that a better quality as well as a larger produce argues that inequality of soil to which I have already referred; a crowded crop may increase the quantity at the expense of the quality; but when there is not only more straw and more grain, but more weight per bushel too, that must be ascribed to something more than the difference in sowing; moreover, the broadcast was sown thicker—7 pecks instead of 6. But the same remark applies still more strongly to the third instance, where, though in the same field, and that, too, not a large one, the crop will be seen to be so much inferior:

	Corn per acre.		Straw per acre.		Weight per bush.
	Bushels.	Gallons.	Trusses.	Pounds.	Pounds.
3. Drilled wheat	20	0	45	33	59
Broadcast ditto	33	3	75	20	60½

It is obvious that there must be a great deterioration in the quantity of the soil in this part of the field, and to a greater extent where it was drilled than where it was broadcast,* for though it was so thin upon the ground, the bushel weighed 1½ lbs. less. The fourth example shows the advantage decidedly in favor of the drill, which is not counterbalanced by any similar objection.

	Corn per acre.		Straw per acre.		Weight per bush.
	Bushels.	Gallons.	Trusses.	Pounds.	Pounds.
4. Drilled wheat	40	0	77	1	62
Broadcast ditto	33	3	66	24	62

In the next place, the evidence of the experiments is very much against thin sowing. It might easily be imagined that since in some seasons and in some localities severe injury is inflicted upon wheat by a variety of minute animals, the crops which have no plants to spare must suffer much more in proportion than those which can afford to lose a great many, and yet retain enough to cover the ground. It would seem unnecessary to insist upon so plain a proposition, were it not that some persons most resolutely shut their eyes against the most obvious truths; for this reason only I will mention a fact which otherwise would not be worth recording. In a field where the wire-worm had been very destructive, 7 pecks of corn sown produced 20 bushels; but where 4 pecks only were sown the quantity was reduced to 13 bushels; and in another, where 8 pecks had been sown the produce was 33 bushels; but where half that quantity was sown the produce was less than half, or 16 bushels; but it was not only under circumstances of disadvantage that thin sowing failed of success; its inferiority was shown, though not in the same degree, when the crop was good, as shown in the following cases:

* I have since examined these soils, and find that in the part of the field where the last experiment was tried there was 5 per cent. less of alumina 12 per cent. less of sand, and 11 per cent. more of lime and magnesia than in the other.

	Corn per acre.		Straw per acre.		Weight of Corn.
	Bushels.	Gallons.	Trusses.	Pounds.	Pounds.
Wheat dibbled, 4 pecks	27	4	57	1	62
.. drilled, 8 pecks	40	0	77	1	61½
.. dibbled, 3¾ pecks	40	0	106	24	60
.. broadcast, 7 pecks	43	2	102	8	61

However, it may be said in this case that the greater weight of the grain, and the greater quantity of corn, from a smaller amount of straw, indicate some accidental superiority of soil; and it proves that in some particular instances good crops may be obtained from a very small amount of seed. The third series of experiments tend to show the advantage of hoeing wheat, though that advantage in the first two cases is limited to a small increase of straw, the measure and weight of grain being just the same under either treatment. The dibbled, both hoed and unhoed, yielded 29 bushels 7 gallons; the drilled, both hoed and unhoed, 43 bushels 2 gallons; but the hoed from 1 to 2 trusses more. In another field the comparison stood thus:

	Grain per acre.		Straw per acre.		Weight of corn.
	Bushels.	Gallons.	Trusses.	Pounds.	Pounds.
Wheat drilled and hoed	35	0	56	26	61
.. drilled but not hoed	33	3	62	34	61
Austrian wheat dibbled but not hoed	43	2	108	8	61
.. .. dibbled and hoed	46	5	128	18	61

Here the advantage of hoeing is very decisive; and I shall have occasion to revert to this subject by-and-by. In the meantime I must observe that though more than 46 bushels of corn can be obtained, as in this instance, from little more than 3 pecks of seed, it does not warrant the general adoption of the practice, for in most cases it would be attended by disappointment; failure is the rule, success is the exception. With respect to the value of manures applied as a top-dressing to meadow land, I continue to find sulphate of ammonia, when applied at the proper season, to be uniformly beneficial and remunerative, though sometimes only to a small extent. In two instances, where ¾ cwt. was employed, the increased value of the hay after deducting the price of the manure, was 1s. 4d. and 7s.; in other trials, where the quantity was 1 cwt., the profits per acre were 3s., 12s. 2d., 14s. 1d. The only instance of loss was where it was sown merely for the sake of the experiment, too late and after the dry weather had set in. But even that may not be ultimately a total loss; for I found upon comparing two portions of land, neither of which had been manured this year, but one had last year received a dressing of the sulphate of ammonia, and the other none—the value of the hay on the former was 3s. 10d. per acre more than on the latter. A similar experiment, when the manure had been guano, gave an increase in one trial of 3s. 9d.; in another none at all. The application of the same manure this year was rather more successful than before; for it failed once, but succeeded twice. The loss was 4s. 4d.; the gains were 3s. 3d. and 7s. 2d. The quantity in the last instance was 2 cwts.; in the others 1½ cwts. But on poor soils the benefit of applying artificial manures to the trefoils was more remarkable. The manures were selected in this case with a special view to the constitution of the plant, and these were the results:

	Weight of hay.			Cost per acre.			Profit.		
	Tons.	Cwts.	Lbs.	£	s.	d.	£	s.	d.
Yellow trefoil, without manure	1	0	106						
1¼ cwts. guano and 1¼ cwts. gypsum	1	6	74	0	15	0	0	7	10
1¼ cwts. guano and 1¼ gyp. 40 bus. ashes	1	11	48	1	10	0	0	11	10
Red clover without manure	1	6	74						
2 cwts. superphosphate of lime	1	12	39	0	14	0	0	8	9
Do. and 40 bushels of ashes	2	0	53	1	9	0	1	6	3
1½ cwts. clover manure	1	13	37	1	1	0	0	5	8
Do. and 40 bushels of ashes	2	9	58	1	16	0	2	15	4

Here it will be observed that the ashes in each instance greatly augmented the fertilizing power of the manures to which they were added; and yet, when used alone, they did not repay their cost by 1s. 8d.; but it follows not from this that separately they have less efficacy in proportion than they have in combination with other substances. General experience shows that they are very favorable to the growth of trefoil; and in this case there is no second trial to check and correct the first. I now pass on to other experiments, embracing both the effects of cultivation and the action of manure, experiments which have been continued for four years on the growth of wheat upon the same ground with the same artificial manures and no other. Two things, however, must be premised: 1. That in the course of the preceding summer, the ground being overrun with the *Convolvulus arvensis*, in order at once to get rid of the weed and to restore to the soil the inorganic food which has thus been abstracted from it, the roots were collected and burned; care, however, being taken to burn on each plot of ground only

those plants which had grown upon it. 2. In the renewed trial, whether artificial manures might not equalize the productiveness of good and bad grain, the latter being left without any artificial aid for five months, more than half of it either did not grow or was destroyed in the winter, and it was necessary to take up the whole of the remaining plants and divide them. Being then replanted they scarcely covered the ground, and stood at such distances from each other as would have satisfied the stoutest advocate for thin sowing. As soon as they had taken root again they were watered with the solutions, and through the summer they were remarkable for the dark-green, vigorous appearance of the foliage; but the straw was shorter than the rest, and was later in ripening by a week or ten days. The results of this treatment and the produce of this year compared with that of the last are shown in the subjoined Tables:

Names of Manures.	1846.				1847.			
	Weight of corn.		Weight of straw.		Weight of corn.		Weight of straw.	
	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.
Good Seed.								
Phosphate of potash, 4 lbs....	12	12	26	15	14	4	35	0
Phosphate of potash, 2 lbs.. } Sulphate ammonia, 2 lbs .. }	13	10	24	2	17	11	40	0
Sulphate ammonia, 4 lbs.....	13	6	24	2	17	13	35	0
No manure.....	13	8	23	14	14	8	33	0
Bad Seed.								
Phosphate potash, 4 lbs.....	10	14	23	6	12	2	28	0
Phosphate potash, 2 lbs.... } Sulphate ammonia, 2 lbs... }	17	8	30	14	18	13	31	0
Sulphate ammonia, 4 lbs.....	16	10	24	6	15	9	30	8
No manure.....	11	10	22	14	12	13	25	0

Here three facts call for remark: 1. In every instance the phosphate of potash seems to have caused a greater production of straw and less of corn; and in one case the sulphate of ammonia had the same effect, but the same weight of manure, consisting of the two combined, produced a very considerable increase of both. 2. Instead of a diminution resulting from a repetition of the same crop, we see in every instance but one a great increase this year of both, even on those parts which received no addition of foreign manure, and the single exception is more apparent than real; for the great increase of straw shows that the falling off was due to some accidental cause. The seasons, which are beyond our control, sometimes produce effects of which we can render no account; but a part, at least, of the increase may be ascribed to the inorganic elements, which were slowly elaborated from the soil in the summer by the weeds being restored to the roots of the corn in a more soluble and therefore in a more available state in the shape of ashes. 3. Though the bad seed did not yield more than the good, as it did last year, yet in proportion to the quantity of straw the produce of corn was greater, and therefore the difference must be ascribed to the thinness of the plant upon the ground; and, farther, not only was the whole amount of corn from the bad seed this year greater than the whole amount from the good seed last year, but in one instance it surpassed the good this year too, and surpassed it not only in quantity but in quality, for the value is tested not by measure but by weight. Much of this success must no doubt be attributed to the complete consolidation of the soil, by the trampling of the transplanters, and the application of the manure to the plants exactly at the critical period of their growth when they were best able to appropriate to their organization the food with which they were supplied. The next chemical manures tried upon a somewhat smaller space of ground were the same as before—sulphate of soda, phosphate of soda, muriate of ammonia, and nitrate of potash. All the seeds were first steeped in a solution of these salts, and half of them in the following spring watered with 6 lbs. of them. For the purpose of comparison the produce is given both of last year and this:

Names of Manures.	1846.				1847.			
	Weight of corn.		Weight of straw.		Weight of corn.		Weight of straw.	
	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.	Lbs.	Oz.
Sulphate of soda watered....	31	2	52	13	35	6	92	0
.. steeped only	29	0	50	2	31	14	77	8
Phosphate of soda watered ..	29	14	46	2	31	0	74	12
.. steeped only	30	12	52	14	32	0	84	12
Muriate of ammonia watered.	34	2	63	0	36	14	109	4
.. steeped only	28	8	52	14	30	10	89	4
Nitrate of potash watered....	30	6	62	14	31	0	90	4
.. steeped only	29	12	62	1	27	13	83	0

The same remarks apply to these as to the former experiments, except that the phosphate of soda seems to be more injurious than the phosphate of potash, since the wheat watered with the solution produced in both years, not only less grain but less straw, too, than where the seed was only steeped. But with the single exception of that which was

steeped in the nitrate of potash, the produce of all this year exceeded that of last year; and even that may be more an apparent than a real exception; for the quantity of straw was nearly one-third more. It only remains to mention that every alternate row having been left unhoed, the produce of those rows was less by 27 lbs. 4 oz. than from those which had been hoed; and the oftener that operation was performed the greater was the increase. But it is necessary to be cautious; for though it is useful to keep the soil open till the lateral fibres of the roots have penetrated it, yet afterward the hoe is mischievous, for it cuts off the mouths by which the plant feeds itself.

Before I conclude, the obvious improvement obtained in these experiments from so small an amount of inorganic manure, leads me to notice a vulgar error which a certain agricultural fanaticism is propagating too successfully all over the country. If any agricultural radical boasts that he has slain his thousands of trees, and claims merit for it as a great benefactor to mankind, he not only shows an utter insensibility to all the beauties of Nature, and a utilitarian dullness destitute of taste, but also a woeful ignorance as to some plain matters of fact. I do not contend that trees do no harm to crops; I freely admit that inclosures may be too small, and trees too numerous; but I do contend that to proscribe them altogether, and to banish them entirely from any extensive farm, is the greatest blunder that can be committed by an agriculturist. Ask the traveler whose eye is wearied by the endless tracts of open lands in France what it is that strikes him most when he crosses the Channel, and he will tell you that it is the richness of the scenery formed by the inclosures; and this is no illusion; it is not a mere impression upon the eye from the intermixture of trees in the landscape; it is a real richness of soil, a real difference of verdure and vegetation produced partly by shelter and partly by the fertilizing operations of Nature. When Mr. Jacob published his account of Agriculture on the Continent, he stated that the return of wheat in the North of France was eight or nine for one. In the inclosed parts of England no good farmer would be content with such a return, though in the most bleak and exposed situations it would not be far from the mark; and why? Because protection from wind is an essential condition of fertility. In a dry soil, especially, the unrestrained action of wind abstracts from the growing plant more moisture than its roots can supply, and therefore tends to weaken and to wither it; and the same effect is produced by the great reduction of temperature which it causes; for it is well known that rapid evaporation is the source of intense cold. But crops want protection from wind in their state of maturity as well as in their state of growth. Wheat and oats sometimes suffer much from the absence of it, and for one bushel that is lost by the neighborhood of trees, ten will sometimes be scattered on the ground by the shaking of the wind.

But farther, though shade is injurious to crops, yet both shade and shelter are wanted for cattle. If they are to be kept in the highest state of health, shade in summer and shelter in winter. Let any one observe what a longing for shade is exhibited by animals in a hot day; how sheep, for instance, cluster under the shadow of a tree, or a hedge, or even a bank, and then say whether, by depriving them of that comfort, you do not subject them to a privation likely to be injurious to their health, or at least very hostile to their thriving well. In winter, again, the want of shelter is admitted on all hands to be hurtful to them, on account of the great combustion of food in the lungs which it occasions, and the great loss of animal heat; and therefore some of those who have deprived them of that which Nature gave them have been driven to invent movable sheds to supply its place. The exterminators of trees, indeed, go so far as to say that all animals should be kept under cover. Be it so; if they can find their system answer to them, let them manure their fields with gold if they will; it is not for me to complain of it. What I do complain of is their propagandism, that they beguile those who have not, and those who cannot have their accommodation, into a belief that, by a partial adoption of their system, but omitting the most material part, they are acting well and wisely. It may be said that animals resorting to hedges and trees for shade and shelter, deposit their manure in places where it must be lost. But why must it be lost? Did anybody ever hear that manure is lost when it is deposited in the fold-yard? And why may it not be collected in one place as well as in another, especially since there is the same intermixture of animal and vegetable matters? for where the droppings fall the leaves fall also. It may be said that they are scattered by the wind over the surface of the ground; well, but if they are scattered, they are not annihilated, and wherever they are deposited their decomposition adds so much useful matter to the soil, and before decomposition they protect the young crop from frost, and prevent the radiation of heat from the earth. Strange it is that when the value of leaves and leaf-mould is so well understood by gardeners, it should be so entirely overlooked by farmers; but since many persons are extremely slow either to perceive or admit inferences from analogy, I determined to bring this question to an issue in a method almost approaching to demonstration.

I had the leaves of a tree which stood apart from all others collected and weighed when they were so far dried by exposure to the air as to be fairly considered dry leaves; their weight was 360 lbs., the space of ground covered by the tree was from 8 to 9 perches, and beyond that area no effect at all from the roots was perceptible. Here, then is more than 3 cwts. of manure to compensate for any

loss sustained from the tree; the next thing was to ascertain what that loss might be on arable land. The mean of three trials upon wheat under the shade of trees, compared with equal spaces in the middle of the field, was for 9 perches a diminution of grain to the amount of 1 bushel and 1 gallon; supposing, however, that it might amount to 2 bushels, which is almost double the result of actual experiment, it would be far more than replaced by 3 cwts. of leaf manure; but in order to bring the proof within a narrower compass of known facts, I farther ascertained that by reducing the leaves to ashes there would remain about 34 lbs. of inorganic manure; now, since the few pounds produced by burning the roots caused an increase of 26 lbs. of grain upon 32 perches, which is 1-5th of an acre, five times that amount will give 130 lbs. per acre, which is more than the weight of 2 bushels of the best wheat. But here the quantity of manure is not strictly determined; in the foregoing experiments the quantities are known, but only the phosphates and the sulphate of soda will serve for comparison, as being wholly inorganic; but the former salts depend so entirely upon combination for the activity which they then possess, that they cannot form the basis of any fair calculation, although both the acid and the bases are found in leaves upon analysis; the sulphate of soda, therefore, alone remains, and even this is very disadvantageous for the purpose, because 17 times more potash, of which the leaves principally consist, are required for a crop of wheat than of soda. Nevertheless it appears that the application of 12 ounces of this inorganic manure increased the crop by 3¼ lbs.; taking it, however, at only 3 lbs., and multiplying it by 45, which is in round numbers the amount of equal doses contained in 34 lbs., the increase would be in return for the leaves 135 lbs. of corn, which again is more than the weight of the 2 bushels supposed to have been lost by the tree. If any one should object that trees only restore to the soil the food of which it had previously deprived it, the objection is quite erroneous, for the plow takes care to cut off all the roots near the surface, and the subsoil only is concerned, and the rest penetrate to a depth which the roots of the crop cannot reach, and there elaborate fresh materials of fertility, and bring up again the soluble manure which had filtered through the soil, or been carried down by the rains. It has now been proved, therefore, that the injury inflicted by trees, though more immediate and obvious to the eye than the benefits they confer, is amply compensated in the ultimate results, and that we are not justified in deforming the country in order to increase its food. I am quite sensible that the preservation of these leafy screens may be carried too far; the best things become bad in excess. It is good for the soil to be warm, it is not good that it should be parched; it is good that it should be moist, it is not good that it should be deluged; it is good to have the benefit of the sun, it is not good to have no shade; it is good to have a free circulation of air, it is not good to be exposed to violent winds. I cannot, therefore, understand how those who at great expense scruple not to cover acres of ground, which might bear wheat, with fold-yards and cattle-sheds, because they economize manure and food, and favor the health of the animals, can proscribe, as an intolerable usurpation, provided they are kept within moderate bounds, those natural manufacturers of manure and shelterers from the storm which cost them nothing, and pay well for any apparent damage, and are a refreshment to the eye and an ornament to the landscape, and a source of fuel for the poor, and a supply of timber for the use of the farm.

L. VERNON HARCOURT,
West Dean House.

THE ENGLISH CORN LAWS.

It much concerns the American farmer and planter to know what is likely to be the effect upon British mind and British interest of the Free Trade policy, so called, under which their Corn Laws were suspended, to let in our grain free. For his agency in the agitation of the Free Trade question, on the affirmative side, it will be recollected that its advocates presented Mr. Cobden with the snug little purse of three-quarters of a million of dollars. We should like to see some Member of Congress, or any other man of power, entitle himself to a like donation from American cultivators of the soil, for diverting to the promotion of agricultural knowledge and improvements, one-fourth of the sum now levied on them, indirectly, for the worse than useless purposes of war.

A writer in a late number of the Mark-Lane Express, thus speaks of the *effect* of Free Trade. If those in power should be brought by experience to his

opinions, we may judge how long it is likely to be before all that will be changed —all will be reversed.

THE EFFECTS OF FREE TRADE.—*Sir*: We have now had more than a year's trial of Free Trade, and let us see what are the great blessings it has entailed on this country. We were told by the advocates for the repeal of these laws, that it would be the means of increasing the demand for our manufactured goods, and the manufacturing and commercial interests of this country would flourish beyond any former period of history. Now how stands the case? Have we not had failures among that body to an extent frightful to contemplate, ay, nearly twenty millions in amount? Men of hitherto high standing as princely merchants, after paying from 10 to 20 and even 30 per cent. to uphold their fast-sinking credit, have been compelled to yield to the pressure of the times, and have fast followed each other in the general crash, till I believe not less than twenty millions in amount of failures have been declared.

I have no doubt that the advocates of Free Trade will say that Free Trade has had nothing to do with our present panic and pressure for money; but I think that a careful perusal of the following statement of the amount required to pay for corn and provisions imported in nine months, ending October 10, 1847, as compared with the amount required for the same period in 1845, will throw some light on the subject:

IMPORTS INTO THE UNITED KINGDOM FOR NINE MONTHS, ENDING OCTOBER 10, 1845 AND 1847.

	In 1845.			In 1847.		
		Price.	Value.		Price.	Value.
		£ s. d.	£		£ s. d.	£
Cattle	11,490	12 0 0	137,880	50,264	12 0 0	603,168
Calves	1,543	2 10 0	3,857	20,313	2 10 0	50,776
Sheep	6,918	1 0 0	6,918	98,020	1 0 0	90,020
Lambs	112	1 0 0	112	3,015	1 0 0	3,015
Hogs	530	2 0 0	1,060	743	2 0 0	1,486
	Cwts.			Cwts.		
Bacon	4,540	2 6 6	10,055	72,995	2 6 6	169,713
Beef	72,066	2 6 6	167,503	99,000	2 6 0	230,150
Butter	189,056	5 0 0	945,280	243,144	5 0 0	1,215,520
Cheese	183,891	2 16 0	514,899	243,601	1 16 0	582,082
	Qrs.			Qrs.		
Wheat	368,442	2 10 0	921,105	1,977,474	3 17 0	7,613,274
Barley	302,826	1 12 0	484,522	710,824	2 9 0	1,777,060
Oats	449,961	1 2 0	497,958	1,454,755	1 12 6	2,363,976
Rye	304	1 10 0	456	61,861	2 16 0	171,210
Maize	47,913	1 10 0	71,869	3,240,588	2 10 0	8,101,470
	Cwts.			Cwts.		
Flour	392,151	0 14 0	274,516	5,774,675	1 2 0	6,352,142
Barley-meal				10,950	0 10 0	5,497
Oatmeal	2,756	0 8 6	1,171	52,044	0 10 0	26,022
Rye-meal				727,287	0 13 0	472,736
Indian-meal				1,335,464	0 13 0	868,001
Hams	4,543	2 16 0	12,720	17,331	2 16 0	48,526
Pork	32,713	2 6 6	76,057	212,544	2 6 6	504,455
Rice	392,205	0 15 0	294,153	1,046,083	0 18 0	991,470
Total			4,410,091			31,241,766

In calculating the prices for each article, I have done so at the nearest average price for each year I can obtain. I have not varied the price for live cattle and dead meat, butter or cheese, as the average price of these articles for both years was so nearly alike; and by this statement it appears that the money required to pay for these articles of Imports in nine months, ending October 10, 1845, was only £4,410,091, but that in the same period of time, ending October 10, 1847, the money value of the same articles imported was £31,241,769. We thus prove that £26,831,678 more money was required to be sent out of this country to foreigners, to pay for these articles; and I find that the declared value of British and Irish produce and manufactures exported in nine months, ending October 10, was as follows:

1845.	1846.	1847.
£41,732,148	£40,008,874	£39,975,207

So that we find that under Free Trade we have diminished exports in nine months, in 1847, as compared with same period for 1845, of £1,766,941, and therefore the balance of trade has been against this country to an extent of £28,593,619. I am foolish enough to imagine that twenty-eight and a half millions of cash being sent abroad to balance this account have caused the derangement in our money matters, and that we must not attribute it to the expenditure of our capital in the payment of labor, &c., for the formation of our railroads.

I remain your obedient servant,

Ickleton, November 29. SAMUEL JONAS.

Let the reader multiply pounds by 5 to get the dollars.

It would be worse than idle to say that we are not deeply interested in the legislative measures of a country to which we exported

In 1847.	Flour.. .....3,150,689 barrels.	In 1847.	Wheat..... 4,015,134 bushels.
..	Corn-meal..... 847,280 ..	..	Indian corn.....17,298,714 ..

besides rye, oats, and barley.

Would it not be well for the steady prosperity of the American farmer, if he could establish some permanent policy, that would invite and bring over the manufacturing capital, skill, and machinery, that gives employment abroad to the men that consume all these provisions? Were they settled down, with their lap-stones, and their looms, close alongside of him, they would bring the cotton on the spot, where it is made, and the corn and wheat where they are grown, and the millions of waste lands in our old States would be yielding their millions of bushels of apples and potatoes, and turnips, and tons of hay and cheese, and the time, and manure. and money, that are now wasted on the road, and in the work of exchange, would be saved to be applied to the improvement of the waste lands: at least it seems so, and *is* so in Massachusetts and Rhode Island, whose population is increasing, lands rising, and education extending more and more.

THE FRUIT-BEARING POWERS OF THE GRAPE-VINE.

Increasing consumption and improved culture of fruits may be considered sure signs of improving morals and civilization. The cultivation of the *Vine* and the melioration of the Grape have made much progress within the last twenty years, in and around some of our large cities, but the wonder, if not the disgrace, is that they still command so little attention, and are so little understood and enjoyed in what we denominate the *country*. The mass of the country people have no conception of the size and perfection of grapes to be seen in the shops of Boston, New-York, and Philadelphia.

The most extensive and perfect vineries that we have ever seen are those of Col. Perkins, of Boston, Mr. Colt, of Paterson, N. J., and those of that late most accomplished gentleman, N. Biddle, at Andalusia. But theirs are not establishments to be imitated by the masses. The Catawba and the Isabella, native grapes, adapted to open culture, are as good as anybody need desire, and these might easily be had by every man who has a few feet of ground and the gable-end of a house or a trellis for them to run on. To any farmer who has not, after being four or five years in the management of a "place," it ought to be as much a matter of reproach and scandal as it should be to his wife to be seen with holes in the heels of her stockings.

Even the country grapes, if properly cultivated, might, many of them, doubtless, be improved to be very good table grapes. But so utterly unread and uninformed are the young people in the country in things that particularly relate to the occupations and resources of their condition, that they grow up in utter ignorance of useful and even elegant branches of knowledge, that might be acquired by a few hours of attention, and that would greatly add to their comforts all the days of their life. Take this very case of *vine culture:* the vulgar notion is that the cultivation of a native grape would consist in manuring and hoeing around it and leaving it, for all the rest, under the influence of its natural growth and instincts; and this would be very well if, instead of an enlarged and meliorated berry filled with delicious juice, and void of seed and pulp, the ob-

ject were nothing but luxuriant and wide-spread growth of wood and leaves. Instead of this, every boy might learn, in some small treatise, highly proper for a *country* school-book, that the cultivator of the vine must or ought to study its *fruit-bearing* powers, the manner of propagating, by cuttings and by layers, and of pruning—the best aspect, soil and manure, &c.

In England, one of the most popular writers and practical *vignerons* has made a series of experiments based on the principle of proportioning the quantity of bearing-wood, retained at the autumn pruning, to the capability of the vine to *mature* its fruit. The results of the experiments were carefully noted from year to year, and the principle established was that the capability of the vines was in direct proportion to the circumference of their respective stems. On the basis of all these observations, Hoare, in his Treatise on the Grape-Vine, lays down the following

SCALE of the greatest quantity of grapes which any vine can perfectly mature in proportion to the circumference of its stem, measured just above the ground.

Circumference.	*Pounds.*	*Circumference.*	*Pounds.*	*Circumference.*	*Pounds.*
3 inches	5	5½ inches	30	8 inches	55
3½ --	10	6 --	35	8½ --	60
4 --	15	6½ --	40	9 --	65
4½ --	20	7 --	45	9½ --	70
5 --	25	7½ --	50	10 --	75

The author says he had no opportunity of testing the rule on vines larger than ten inches in circumference; and, finally, he adds that with respect to the number of buds that are necessary to be left at the autumnal pruning to produce any given weight of fruit, he has found it to be a good general rule, applicable to all those kinds of grapes usually cultivated on an open wall, to consider every bud (rejecting the two bottom ones on each shoot) as equal to the production of half a pound weight of fruit—that is, if the stem of the vine be five inches in girth, its capability is equal to the maturation of 25 pounds weight of grapes, and therefore the number of buds to remain after pruning will be fifty. But he refers, doubtless, to vines that have been well and carefully reared.

The twelve kinds of grapes he recommends as most suitable for culture on open walls, are *Black Hamburgh*, *Black Prince*, *Esperiore*, *Black Muscadine*, *Miller's Burgundy*, *Claret Grape*, *Black Frontignac*, *Grizzly Frontignac*, *White Muscadine*, *Malmsey Muscadine*, *White Sweetwater*. But young beginners and people in the country generally, would do well to confine their attention to the *Catawba*, the *Isabella* and the *Sweetwater*, and to see what may be made of native grapes, yet to be tamed and meliorated. The same results may not be reached, precisely, with us; we merely give this sketch to let the young agriculturist see that there are principles to be sought in everything, and he should regard as a flagrant indignity and insult to his profession any insinuation that it is not a business of Art and Science as well as building and navigating a ship. But perhaps the young reader is content to consider his farm in the light of a ship, and to go himself as a common sailor before the mast? If so, why all we have farther to say is, that he must be left to his fate—*Quisque suos patimur manes*—"Each has his fate, and bears the lot he drew." And the lot of all such drones is, like that of agriculturists generally, to be saddled and bridled and ridden by any demagogue partisan who can first get his foot in the stirrup. In matters of public policy, and their real bearing on the landed interest, farmers rarely inquire—rarely think for themselves. Their party faith, once pinned on their sleeves by some leader, who is himself led by some higher leader—all in search of office, big and little—there it sticks forever. In politics, as well as

in farming, they mistake doggedness for consistency, and look on all change of opinion as an apostacy of principle. For such men was written the following

SONG.

I 'LL FARM LIKE MY FATHERS BEFORE ME.

When my landlord says "John,
You must really get on—
Just see how your neighbors are striving;
We must be improving,
And onward keep moving;
Depend that 's the right road to thriving"—
"Sir, I pay when I can;
I 'm a hard-working man;
At elections you know, you get o'er me.
Let them do as they may,
I prefer the old way—
I 'll farm like my fathers before me.

"There is Berwickshire Dick—
Of the fellow I 'm sick—
They say that his crops are so charming;
And there is East Lothian Will,
He is worse and worse still;
They boast—*how* they boast of his farming!—
Everything is so good,
And so well understood!—
It 's all just to chafe and to bore me:
But I care not a jot,
For I value them not—
I 'll farm like my fathers before me.

"There 's nothing but toiling
At draining, subsoiling,
And grubbing old hedge-rows and fences;
It is all very neat,
When the thing is complete,
But dreadful to think what expenses!
Should I spend on the land,
I cannot understand
How cash it again would restore me:
I shall therefore take care
Aught that I get to spare
I 'll keep like my fathers before me.

"To the markets they ride,
In the flush of their pride,
As if they were pinks of creation;
On the best they will dine,
And sit over their wine,
And talk about crops and rotation;
But how they do contrive
To get RICH—man alive!
That certainly RATHER *gets o'er me!*
But I care not a jot,
For I envy them not—
I 'll farm like my fathers before me.

"There 's such new-fangled ways
About dung now-a-days,
Whole islands have gone to destruction;
It 's absurd to suppose
That so tiny a dose
Can greatly increase the production.
About liquid manure
I 'm not quite so sure;
But *trouble* and *tanks*, I abhor ye!
'T was my old father's song:
'Jack, thou 'lt never do wrong
To farm like thy fathers before thee.

"Improvements in breeding,
And new modes of feeding;
'Bout Science they 'll preach you a sermon.
They may boast of Liebig,
But I care not a fig;
He 's nought but some cunning old German.
They talk about gases
Like thundering asses—
Such nonsense shall never get o'er me.
I have just this to say:
I prefer the old way—
I 'll farm like my fathers before me."

ANALYSIS OF INDIAN CORN.

THIS long-sought desideratum is at last likely to be obtained. We have had analyses of the grain of Indian Corn, as well in America as in Europe. We have already published in this Journal, in June of last year, the results of examinations of the *grain*, made by Fromberg, and by Letellier—and of the *ash* of the corn *blade*, by Hruschauer. In the latter case the analysis was of the "straw" of corn grown on different soils—the first on a soil formed from the debris of primary rocks, the second on a mountain limestone—and the result showed great difference, both in the total per cent. of the ash left, and in the proportions of every one of the constituents which the ash contains.

The mean of the two specimens from these different soils was:

Potash	9·62	Phosphoric acid	17·08
Soda	26·30	Sulphate of lime	1·19
Lime	7·97	Chloride of sodium	3·42
Magnesia	6·64	Silica	26·97
Oxide of iron	0·81	Total	100·00

The per centage of ash was in one case 2·30; in the other, or that from the limestone mountain land, 6·50—mean, 4·40. Thus, says Professor Johnston, 60

bushels of corn, each 60 pounds, which he says "is considered a good [he might have said great] average return even in favorable districts, supposing them to yield 1½ per cent. of ash, which is about what is left by the *grain*, would carry off the land 54 pounds of inorganic matter, consisting of:

Potash and soda	16·6	Phosphoric acid	27·1
Lime	0·7	Silica	0·4
Magnesia	9·2	Total	54 0

According to the analysis made by Letellier, it would seem that the ash of Indian Corn consists almost entirely of the phosphates of potash, soda, and magnesia. Should not the corn-grower take heed of such things? But Professor Johnston notes—what we have repeatedly referred to and urged upon those whose business it is to take measures to get the information—"We have no accurate returns," says he, "of the *proportion which the weight of the straw and leaves bears* to that of the corn of the same plant."

The New-York State Agricultural Society, with becoming attention to what Agriculture really needs for its enlightenment and progress, has, we believe, taken steps to obtain this information.

In our so-called National Census, no notice whatever is taken of any part of this great staple of the country, except of the *grain*.

In the last number of this Journal we have given, moreover, the *average composition*—that is, the proportion of water, woody fibre or husk, starch, gum, sugar, gluten, albumen, fatty matter, saline matter, &c., in more than twenty of the common grains, roots and grasses—as nearly as the present state of knowledge has enabled the most scientific men to represent it—*Indian Corn* among the rest. The same number of this Journal gives the average produce of nutritive matter per acre from a given quantity of each—including Indian Corn. If, in England or France, the subject possessed half the interest that it does for America, it would have been yet far more thoroughly investigated. What is needed for the information and government of American agriculturists, in respect of a grain cultivated throughout the length and breadth of the whole country, is, as we have repeatedly urged, to have a careful analysis of each part of the plant, as well in its green as its dry state—its stalk, blade, top, shuck, and cob, as well as the grain—and it is highly desirable to know the *proportion* of each of these parts to a given amount of grain. We mean not the *exact*, but the general, ordinary proportion in different parts of the country, where very different kinds of corn are suited to the climate, and where, therefore, very different proportions will prevail. The practical benefit would be of great and almost universal value. It would enable every corn-planter, on measuring his *grain*, which most of them do, to approximate, at least, the quantity of nutritive matter besides, which his fields had yielded him per acre, in return for his outlay. This is, as we have before stated, the sort of real, solid, noiseless service that the American Institute ought to be rendering, instead of hoarding up its money in stocks, to lay by for a chance at a speculation in farms and colleges, if the State can be persuaded to establish one and put it under its "auspices." For one, we will willingly contribute a set of The Farmers' Library, containing 6 vols. of about 3,500 pages, and three of which contain works that could not be imported for less than $35, with several hundred engravings—many of them costly steel engravings and lithographic prints; we will gladly throw in these six volumes toward getting these investigations *carefully* made.

Mr. Colt, of Paterson, long since offered $100 toward getting it done, if the American Institute, with its thousands in "5 per cent. stocks," would undertake it.

In the meantime, however, a friend of Professor Jackson, of Boston, (whose name is a guaranty for the accuracy and soundness of the research,) having called his attention to the patriotic offer of Mr. Colt, has consented, as we have been informed, to make the analysis—not in any consideration of the sum named, liberal as that was, on the part of an individual, no more interested than others, but, as it is but just to say, in a high public spirit to render service to the cause of Agriculture and of Science. It will presently be seen that Professor Henry says the work of a complete analysis will require much labor, and cannot be completed *under a year or two;* and we may mention that, on application on this subject to Professor Norton, than whom there need be no better judge, doubtful if he could for some time command leisure to undertake it, he thought it could not be expected to be properly done for less than $500. This may give some idea of the labor and care to be bestowed on what men like ourselves, not possessing the science and apparatus for such investigations, are apt to look on as mere trifles. Such investigations are, or ought to be, provided and well paid for by Institutions and Societies that hold in trust the money of the public for the benefit of the public, and ought not to be a tax on individuals, however able and liberal. Such men have always calls enough upon their generosity from quarters that have no claim on public institutions. We rejoice, however, now to see that the *Smithsonian Institute* will, as soon as may be, take this, and doubtless other analogous matters in hand; and we only express the public voice when we say that what has the sanction of the really learned Secretary of *that* institution, the public will believe in. The American Institute, with its thousands in stocks, and all other such Institutes, far from hesitating and holding back, and *talking* on such occasions, ought to be constantly on the look-out for opportunities like these to benefit great public interests of which it professes to have supervision. But seeing now that the Smithsonian Institute, or the Patent Office, will undertake to have this laborious and tedious analysis thoroughly made, do we go out of the way to suggest that it would be but fair to relinquish all claim on the liberality of individuals either for contributions in money, or yet greater contributions in labor and in precious time, which is but too often the only capital of men competent to push such inquiries to reliable results?

How much better would the thousands laid up in "5 per cent. stocks," be employed in eliciting from such men, and from skillful mechanicians, analyses, dissertations and inventions calculated to economize and render more efficient the labor and the means employed in all our industrial pursuits, and in importing at once drawings, models, seeds, grains, fruits, machines—in a word, whatever may be discovered abroad, or whatever the wants of Industry suggest as needed, and which may possibly be discovered at home under the stimulus, not of picayune medals and blank diplomas, to be filled up to order, but liberal rewards for the time and labor bestowed by men who have nothing else to depend on? Suppose, for instance, instead of merely providing a show-ground for the advertisement and display of highly polished hats and boots, and specimen saddlery and cutlery, and overgrown bullocks, and huge carrots and turnips, none of which display any new principle, or add a mite to the stock of knowledge connected with the arts of Agriculture or Manufactures, they were to offer to Professor JOHNSTON, of world-wide renown, some adequate inducement to come over and deliver a short course of Lectures on the application of Science to Agriculture, which might be published and disseminated throughout the coun-

try, with far more benefit than the mere statistical *facts* and ascertained results of practices with which every one is familiar—such as make Patent-Office Reports, Shipping Lists, &c.?

Thanks, however, to men of real activity of mind and genuine public spirit, we are in a fair way, as may here be seen, to have a least a thorough analysis of Indian Corn—such as we should have had years ago, at the cost of thousands on thousands of dollars, if necessary, could it have been made probable that at the bottom of the crucible we should find some improved and more efficient mode of *shedding human blood?*

JOHN S. SKINNER, Esq. CLEVELAND, O., March 27, 1848.

Dear Sir: Professor Henry has sent me the following analysis of Indian Corn, which was made by M. Payen, which he thinks may be relied on, viz:

Starch	28·40	Cellular tissue	26·00
Nitrogenized matter	4·80	Dextrine	2·00
Fat matter (oil)	35·60	Various salts	7.20
Coloring matter	20	Total	98·20

Prof. Henry says that an acuurate analysis of the various plants and grains used in domestic economy in this country is a *desideratum*, and that he had just had a conversation with the Commissioner of Patents on the subject, and that they had concluded as soon as practicable to have an analysis made, either at the expense of the Smithsonian Institute, of which the Professor is Secretary, or of the Patent Office. The Professor states that the work will require much labor, and cannot be concluded under a year or two. Knowing the anxiety of he public for a work of this utility, I hasten to inform you of it.

Yours, respectfully, J. R. STAFFORD.

Extract of a letter to the Editor of The Farmers' Library, from A. G. SUMMER, Esq. Editor of the "South Carolinian."

"I see that Mr. Colt is desirous of having an analysis of Indian Corn. My brother, who has been a pupil of Liebig for one and a half years, is now engaged under his direction in making a correct analysis of Indian Corn, the Cotton plant and Indian Pea, as I sent him the ashes, and also the stalks, grain and seed of all these plants. When he does make it, I will send you an account for The Farmers' Library."

REPORT ON IMPLEMENTS,

BY THE AGRICULTURAL COMMITTEE OF NEWCASTLE COUNTY, DELAWARE

THE following Report is worthy of particular attention, showing that greater progress has been made in the little State of Delaware, than in any in the Union, porportionally to her size and population, in the way of *introducing the most important and highly finished labor-saving implements;* a matter much more worthy of the regard and encouragement of Agricultural Societies, than hundreds of other trifling objects on which they bestow their attention, and of which the chief purposes are to amuse and gull the public, without doing any *real service to Agriculture*—to keep up a sort of gambling spirit, miscalled emulation.

Our agriculturists are themselves so little instructed—as they should be at school—in the principles of labor-saving machinery, (what, in truth are they instructed in that relates to their *own* profession?) that one of their first cares should be to stimulate and reward the ingenuity of artisans and machinists, who strike out things for their use, which economize labor and are valuable in the field. They ought to remember that a machine that will save the labor of one

man even, or one horse, is worth to them every year what it would cost to pay and feed a man; and yet much more where it saves the labor of a horse, for it will cost as much to keep one horse as to keep two men. True, you pay no wages to the horse, except the interest on the sum he would sell for, or what he cost; but then he is liable to be killed any day or night by a small worm, and your capital is lost forever. The machine eats nothing; and yet for showing an overgrown stallion or bullock—which any one may raise and fatten—the exhibitor gets the *highest prize* at the command of the Society: but for the exhibition of an improved machine, which is the product of much and anxious intellectual exercise, and which displays the finest combinations of mechanical principles, and which it is expensive to exhibit, as it must be transported and can 't walk to the Shows, our wise Institutes and Societies reserve a quire of blank printed "*Certificates of Merit*," which they fill up to order, and which, costing a picayune each, are often filled up for things that get lauded to the skies at the time, and are never more heard of.

The trial of machines should be conducted by accomplished engineers and men of science; such, for instance, in Delaware, as Major Trimble and Doctor Thompson, united with practical and disinterested farmers,—as Jones and Reybold, and Clark—men of known abilities and experience, who could not be made noses of wax, and who would only decide on the most careful and thorough trial; and it would be much better even to pay such men well for their time, than to hoard up the money of these Institutes and Societies, for the sake of saying they have "*so much stock in the funds!*"

The New-York State Society has laid by eight thousand dollars, and the American Institute perhaps as much. The former has very wisely and in a proper spirit offered premiums, we believe, to the amount of more than six thousand, while the latter buys stocks, and lays by for a chance at a Farm, and a *wing* of a College, if the State will only buy the *body*, and put the whole fowl in their keeping; or in other, if not such plain words, "*under the auspices*" of the American Institute—instead of offering all, except enough to meet the expenses of their next meeting, for essays on subjects which agriculturists need to be enlightened upon, and for objects that it would not fail for the benefit of Agriculture, to bring into activity the genius of all the great machinists of the country and the world!—for in such cases, we should not confine ourselves to any country, but take the best and most perfect and economical contrivance, if invented by the Old Boy himself, and be glad to get that much out of him for the good of mankind. Why not, out of their thousands that are hoarded up, offer $500 for some *new and valuable application of Steam to Agriculture?* Why not have traveling steam machines, going through the country cutting ditches and draining marshes, and digging ice-houses and cellars, and making roads, boring for water, and for marl, coal, and other minerals?

Go into your towns, and see there what it is doing for the printer, and the cabinet-maker, and the carpenter, and the ship-builder—all the branches of manufactures and mechanics! Go into your Government Arsenals and Navy Yards, and see what steam is doing in the way of forging and finishing chain cables, and cannon and small arms, even to making screws for gun-locks, and how much labor and money it has been made to save in the preparation and repair of all the engines of human destruction! because these economical uses of it have been elicited and paid for, by the Public Treasure of the country, and that, too, collected chiefly from the *cultivators of the soil! But what is Steam doing for Agri-*

culture ? Has the Government ever offered one dollar to reward any application of that mighty power to agricultural or peaceful productive purposes? *No, not one !* And what are the lazy drones about, who compose our Agricultural Committees in Congress, and in all our States, that they do not, or dare not begin to inquire into what might be done, and what the farmer and planter have a right *to demand* should be done in this direction? For Col. Emory's or Col. Fremont's or any other *military* survey, there is no difficulty in getting thousands on thousands voted by those in Congress, who are sent there by farmers and planters. They have no scruple in giving $100,000 of their constituents' money, to have an examination made even of the "Dead Sea," but not a dollar for an agricultural survey.

For the maintenance of a single seventy-four afloat, the Nation pays as much ($200,000 annually) as would maintain a Normal School in every State in this Union, for qualifying teachers for our Common Schools, to give instruction in the application of Geology, Botany, Chemistry, and Mechanics, as applicable to the practice of Agriculture; and yet our Agricultural Committees and Societies look on passively upon such infamous prostitution of the powers and ends of Government, without the energy or courage to lift one voice against it. Can any people who submit to such imposture and abuse, claim to have emerged from a state of barbarism? and yet we boast of the blessings of free and of self-government!! paying for warlike establishments 80 per cent. of all our expenses!!!

REPORT OF THE COMMITTEE.

The Committee on Agricultural Implements regret that farmers and mechanists have been so remiss in not bringing out valuable implements, known to have been put in successful operation, within a few years, in different parts of this country and this State—among which are,

1st. *Hussey's Reaping-Machine,* upward of thirty of which are owned in this County. Twenty of these were introduced the last harvest, varying in price from $100 to $175 each. The work done by them has been eminently satisfactory the past season. Mr. Bryan Jackson and Col. J. W. Andrews report that they cut—with one of the largest size—24 acres of heavy wheat in one day. Mr. Wm. Bowman reports that he cut 14 acres in half a day. These are extra days' work, and can only be accomplished with good horses and at good speed. From 15 to 20 acres may be deemed a fair day's work.

2d. *Hussey's Mowing-Machine,* with cutters on the same principle as those of the Reaper, has been successfully tried in this County, and if done at the same speed, will cut from 10 to 15 acres per day.

3d. *Pennock's Drill.*—This implement has been in use 5 or 6 years, with great success. W. J. C. Clark, the President of the Newcastle County Agricultural Society, stated before the Society that he sowed a part of his field with this drill last year, at the rate of one and one-fourth bushels of wheat to the acre, and that the yield of the drilled was more than double that of the part of the same field upon which two and a half bushels of wheat had been sown to the acre broadcast.

4th. Mr. J. Carr, of Brandywine Hundred, has recently imported a drill from England, at a cost of nearly three hundred dollars. This machine has the management box, and is constructed so as to sow the concentrated manures, poudrette, guano, ashes, &c., at the same time of sowing the wheat.

The thanks of this Society and the farmers of the County are due to Mr. Carr for his public spirit in sending to England (his fatherland) an order to purchase the best and most improved implement of the kind in the Kingdom, regardless of cost, (in which he was most fortunate, as he got the identical implement which took the first premium at the Royal Agricultural Exhibition)—particularly when it is known that he (Mr. Carr) has invited all farmers and machinists to

come forward and examine it, and to build and use from the same pattern free of charge.*

5th. *Threshing-Machines.*—We have in St. George's Hundred four superior Threshing-Machines or Separators, which get out and clean the wheat ready for market at the one operation, 400 bushels per day, if well attended. The first two of these Separators were brought from Rochester, New-York, last June, by B. F. French & Co. The other two were purchased, and are now owned, by J. & Isaac Woods, of St. George's. They have all been used with much success.

6th. *Hemp-Brake.*—A Hemp-brake of simple construction has been invented and patented by an ingenious fellow-citizen, Mr. Frank Holcomb. It has been successfully tried in the presence of a portion of this Committee, who doubt not that the implement will eventually be nearly as valuable to the hemp-grower of the West as Whitney's cotton-gin was to the cotton-grower of the South.

7th. There is one other huge machine, which has been in operation for nearly one year, throughout the land, which has been highly spoken of by its inventors, and by the Editor of the Gazette particularly, as the best implement for the farmer ever yet invented or used in this country. The Committee not being instructed by the Society to examine or report on this thing, will take this occasion to remark that it is customary among some inventors (tinkers, perhaps,) to offer their invention one year on trial; but if at the end of that time the article did not answer the purpose for which it was intended, then the inventor gave up the experiment, and replaced the old machine. It is hoped the inventor of this thing will follow the example set by that good old custom, if at the end of the year their invention should be deficient. This machine is called the "*Tariff of* 1846." It has had a fair trial. Will they do it? The Committee farther remark that, if they or either of them should ever be placed by their fellow-citizens in a situation that would require them to make a Report on such an article, they will give the subject all that consideration that its importance would demand, to the extent of their limited information.

J. JONES,
H. CAZEIN,
J. CLAYTON,
} Committee.

PATENT OFFICE REPORT.

MR. FLEISCHMANN'S PAPER ON GERMAN SHEEP CULTURE.

By the politeness of one of the Editors of the New-York Courier and Enquirer, which we gratefully acknowledge, we have received copious extracts from a paper on German Sheep Culture, (in the forthcoming Patent Office Report), by Mr. Charles Fleischmann, "formerly a draughtsman of the Patent Office." The information which he gives us in relation to the German management is interesting, as might be expected from a candid and accomplished observer; but so far as our extracts go, seem to us not new in many important particulars. The same has, for the most part, been published by European and American writers on Sheep Husbandry.

[* This is exactly the sort of service which ought to be expected from great National Institutes and State Societies, instead of leaving the cost, risk and trouble to individuals. Those who collect money in hundreds and thousands should be required to look after and import all such things; and we have no hesitation in saying that the nation that would give a medal or a sword for bloody execution done in the barbarous trade of war, in preference to bestowing higher distinction on such an act as Mr. Carr's, is only half impressed with the true spirit of civilization; that it has but an imperfect perception of its true interests, and deserves not the name of an enlightened and free People. *Ed. Farm. Lib.*]

Mr. Fleischmann (himself a German,) falls into a very common error among writers, in apparently not bearing sufficiently in mind that what may be proper and economical in one country, may be precisely the reverse of all this, in another. In Germany, land is dear, and is economized to an extent of which an American would form little conception: labor, on the other hand, is plenty and cheap. The German system of managing sheep, given by Mr. Fleischmann, would cost more, here, than the wool would sell for. Expensive stabling in winter, conducted with a degree of attention which requires the temperature of the stables, even, to be constantly regulated by a thermometer—regulations for summer pasturage involving the same constant care—more than many of our hardy pioneers bestow on their *children*—will never do in this country. Mr. Fleischmann gives *fourteen* rules for *pasturing* sheep, every one requiring the constant attendance of men—in the aggregate of a good many men—if the flock be large! This will never do in the United States. It is contrary to all the habits of our people. And, as our New-England brethren expressively say, "*it won't pay.*" An American farmer will smile to be told, for example, that at some seasons of the year, the sheep should be driven about their pastures, when they first enter them, to cause the *spiders* to "fly to their retreats" to prevent their *being eaten by the sheep*, which (the *eating of spiders*) "causes a slight purgation!" They are to be driven about stubble and grass lands in the fall to "take off the *cobwebs* with their legs," which when eaten by the sheep "seem to have injurious effects!" These are from Mr. Fleischmann's 6th rule for pasturing.

And the American farmer will be likely to be still more struck at the 9th rule, which we give verbatim, the italicizing, however, being our own:

"Nothing is so injurious to sheep and *wool* as a sudden fright. In the night, when they are penned, in the open field, when there is a storm approaching with heavy thunder, the shepherd must *walk around the pen and talk to them in order to quiet them.* When they get much frightened, they rush to one side of the hurdles, upset it, and break loose."

Many of Mr. Fleischmann's general propositions in relation to the comparative adaptation of different countries, and different parts of our own country, to wool culture, the future demand and supply, markets, &c., correspond with those previously published in this Journal, in the very comprehensive series of Letters on Sheep Husbandry, by Colonel Henry S. Randall. Mr. Fleisch mann's views, however, have nothing of the fullness, detail, and array of corroborating facts possessed by Col. Randall's.

In one point they differ, however, and *we* entirely agree with the latter gentleman in the premises: Mr. Fleischmann quotes the statements of a German writer by the name of Elsner, that "highly improved sheep do not last well in this country," meaning thereby, as we judge by the context, that the high quality of wool of highly improved sheep cannot be kept up in this country. Mr. Fleischmann remarks on the low quality of our wools, but excuses it as follows:

"The fact is we have as yet imported very few highly improved sheep, and the few that were brought here *were neglected in consequence of the want of knowledge, or that indefatigable attention which the Merino (Saxon) sheep requires.*"

Had Mr. Fleischmann seen the Saxon wool of the best American flocks, when he expresses this impression? When he speaks of the *ignorance* and *neglect* of American growers of fine wool, did he know anything of the Groves, the Swifts, the Beekmans, the Tildens, and the Morrels of New-York—the Smiths of

Connecticut, the Grants of New-Hampshire, the Perkinses and the Browns of Ohio, the Edgingtons of Virginia, &c. &c. ? We may perhaps better judge from his own admission, whether he possessed the requisite facilities for knowing that would seem to be necessary, to justify him in so summarily pronouncing against the care and intelligence of the American wool-grower. Immediately after the extract above, he continues:

"As far as my own observation goes, I have found that the wool grown in the United States, has a remarkable softness. *I have not yet seen wool from very highly improved sheep; the samples which came to my notice were, with the exception of a few, from good half-bloods;* but even that coarse kind had a high degree of softness."

Our climate has done much for us: even our half-blood wool is uncommonly soft—the fault is all, as he seems to think, in the badness of the sheep originally imported, and in the ignorance and carelessness of our breeders! and thus it would appear that he judges rather hastily, as we respectfully think, without farther investigation, after inspecting samples of our *half-blood wool!*

Had Mr. Fleischmann ever heard of Henry D. Grove, who unfortunately died in the very prime of his manhood, some four or five years since, in Rensselaer County, New-York? Born in Saxony, the nephew of an extensive wool-grower, on whose farm he was brought up, educated to the care and selection of choice Saxon sheep from childhood, a man of concededly exquisite judgment in sheep —who doated on them, and spent his life among them—a man of intelligence and of an integrity which was never even suspected: what does *he* say about the sheep imported to this country from Germany? He says *he* imported *picked sheep* from the *choicest flocks in Germany.* True, many of these were adulterated by being bred in this country, with mongrels imported at the same time.—But not so with Mr. Grove's own flock. He selected them in Germany, imported them himself, and bred them pure. And we are farther knowing to the fact that but a few years before death, he sent his experienced and trusty shepherd to the most celebrated flock of Germany to procure, without regard to price, rams to improve his flock—that the shepherd returned without purchasing, as he decided that he could find no rams which would improve Mr. Grove's flock. Mr. Grove repeatedly sent specimens of his wool to Germany to be compared with that of the best flocks, those thought to combine the most good properties, and the comparison never resulted to his discredit. Now one thing is certain. We can name a number of other flock-masters in different States who breed as fine wool, and as good sheep in other respects, as did Mr. Grove.

Was Mr. Grove ignorant of his business or careless? The results already stated show. And equal results among American breeders, show *as much in their favor.*

We grant that finer wool is occasionally grown from a little, delicate pound, or pound and a half, fleeced sheep, in Germany, than it is *common* to grow in the United States, though it is not unusual to see such individual sheep here. Our flock-masters usually exclude such feeble, over-bred sheep from their flocks. Their wool will not pay for the cost of producing it. Had Mr. Fleischmann have said, therefore, that it was not common to grow as fine Saxon wool in the United States, as is sometimes grown in Germany, we should have taken no exceptions to his remarks. Mr. Grove and our other breeders have thought it took something besides extreme fineness of wool to make good sheep. The price of labor and wool here, will not permit sheep to be nurtured with more care than our *babies!* But when he asserts that "few highly improved sheep have been im-

ported into this country," and those few spoiled by *ignorance* and *want of attention*, we must take the liberty of excepting to such wholesale assertions.

Two years since, a flock was imported into Connecticut by Mr. Tayntor, selected with infinite care from the best to be found in Europe.

THE OSAGE ORANGE FOR HEDGES.

The Osage Orange (*Maclura aurantiaca*), known also by the names of "Osage Apple," "Bow-wood," and *Bois d'arc*, is indigenous to Arkansas, Texas, and Upper Missouri, and may be safely cultivated for hedges or ornament wherever the Isabella grape vine will thrive and mature its fruit in open air. In its natural habitat, the Osage Orange forms a beautiful, deciduous-leaved tree, often growing to a hight of twenty-five to thirty feet, with a trunk from twelve to eighteen inches in diameter; and in very favorable situations, it sometimes attains double these dimensions. The general appearance of this tree greatly resembles that of the common Orange; and when we view the beauty and splendor of its dark, shining foilage, large, golden fruit, and the numerous sharp spines which the branches present, we are strongly impressed by the comparison. The juice of the young wood, leaves, and fruit, consists of a milky fluid, of an acrid or insipid taste, which soon dries on exposure to the air, and contains a considerable proportion of an elastic gum. The fruit, however, in open culture, does not ripen its seeds north of Philadelphia.

The most important use to which the Osage Orange can be applied is for the formation of hedges, and there is no plant, in our estimation, better adapted for this purpose, in any part of the country where this tree will thrive. Apprehensions have been expressed by some that, from its rapid growth, it will soon become too large for live hedges, which, it is thought, will not endure for a great length of time. This, however, remains yet to be proved. We have no doubt, in our own minds, that, if a judicious system be pursued, in trimming and *heading down*, they will serve an excellent purpose for twenty and perhaps thirty years; for there are hedges of this plant in the vicinity of Cincinnati, which are ten years old, and have thus far proved perfectly hardy, very uniform, neat, and handsome in their appearance, and free from the attacks of insects or disease.

The Osage Orange may readily be propagated by seeds, from which it will grow sufficiently large in three years to form a hedge. It succeeds best on land moderately rich, such, for instance, as will produce good Indian Corn; but it will grow in almost any soil that is not too moist. The line of ground, intended for a hedge, should first be dug and well pulverized, say from 12 to 15 inches deep, and 2 feet wide, along the center of which the plants may be set at a distance of one foot apart.

The seeds, before sowing, should be soaked in water, in a warm room, for four or five days; or they may be mixed with equal parts, by measure, of sand, and exposed a few weeks, in open boxes, to wintry weather, on the sunny side of a building, in order to freeze and thaw. It is preferable to sow them early in the spring, in a garden or nursery, where they will shortly germinate and form young plants. These should carefully be weeded or hoed during the first season's growth, and transplanted in the hedge-line in the month of March or April of the following year.

NOTES ON MANURE.

Liquid Manure.—As liquid manure is likely to become in general use by our agriculturists, and as Government has issued an order that manure-tanks shall be established in the yards of the different cavalry barracks throughout the United Kingdom, the following *memoire* on dung-pits and the treatment and great advantage of liquid manure, so long neglected on the Continent and in this country, has been presented to the Society of Sciences, Agriculture and Arts of the Department of the Lower Rhine, by Ch. H. Schattenmann, Member of the General Council of the Lower Rhine, and Director of the mines of Bouxwiller. After giving a description and a plan of his model dung-tanks, which can be made to any size, from an old sunken cask to a well-bricked pit, with a filtrating-vessel, and pump with irrigating tubes, to disperse it over the land, he then gives his method of treatment:—The dung is submitted to a fermentation, so that the straw becomes decomposed and the ammonia developed. This fermentation is extremely violent for horse-dung, producing a great heat. It is therefore requisite to overcome it, which is easily accomplished by packing the dung as closely as possible, and well watering it once or twice a week; as the con-

fining it moderates the fermentation by preventing too great an access of air, and the water soddens it and hastens the maturity of the dung, so that by this means in six weeks or two months is obtained a perfect manure. He had at several periods thus disposed the dung of 200 or 300 artillery horses, quartered at Bouxwiller, which he placed in a pit containing two compartments of 400 square metres (1,200 feet) in surface, by filling them up from 9 to 12 feet. On opening these large masses, they always presented in every part of the interior a perfect manure, and as substantial and stronger than that of cow-dung. Horse-dung is more substantial than that of horned cattle, but it often loses its quality by a too violent fermentation, from which few know how to preserve it, and which burns and moulders a portion of the straw, and drives away the ammonia by evaporation. Little attention is generally paid to the large quantity of water required for horse-dung, which causes a continual evaporation. It should therefore be well watered from a pump that spreads it over every part, and saves much labor, while at the same time the water penetrates so that the heap at last becomes so compact that it is a solid mass. Some parties have the plan of raking up or turning the dung, thinking to make it turn the sooner; but this has a bad effect, as it becomes musty and often spoils—being more accessible to the air it ferments more violently, and soon loses its humidity, which, when closely packed, it preserves.

This manure enjoys great reputation in Switzerland, where it is chiefly used in watering the prairies [meadows], and frequently the dung is washed so as to increase the strength of the liquid. This is well suited for that country. Liquid manures, such as purins and fecal matters generally, only fertilize but one crop, and they usually try to expend them during damp or cloudy weather, because a burning sun would evaporate the carbonate of ammonia before the plants over which the liquid is sprinkled could absorb it. But when the carbonate of ammonia of these liquid manures is converted into sulphate or muriate, by sulphate of iron, sulphuric acid, muriatic acid, or chalk [gypsum?], there is no longer any loss of the ammonia by atmospheric influences, and the effect of such manure is felt for several years, according to the more or less quantity irrigated. He has conveyed every week to the dung-tank or pit, the fecal matters from the schools of Bouxwiller, and he has found it quite unnecessary to have a special reservoir to unite these matters. The water-closets of the schools of Bouxwiller are arranged with movable tubs, in which is placed previously a solution of sulphate of iron, which, by disinfecting fecal matter, prevents every nauseous smell or inconvenience arising from it. [English paper.

[How easy would it be for any man of enterprise, farming in the neighborhood, to collect immense stores of fertility from the privies at Washington, provided for the public buildings; and also at our watering-places. In Europe, such valuable resources bring a large revenue.

Ed. Farm. Lib.]

PROPORTION OF MILK TO BUTTER.

Sometimes it is desirable to know the proportion between the quantity of milk and the butter produced from it; for the question is sometimes presented to farmers, whether it is better to sell milk or make butter. Yet no definite rule can be given, as milk varies in richness and its butter qualities, not only from the general breed of animals, but from individuals of the same breed, and also from the food.

The difference is sometimes one-half. The Alderney cows give very rich milk, seven quarts of which will often, if not generally, produce a pound of butter; while the milk of some cows is so poor that it takes nineteen or twenty quarts of milk for a pound of butter. The famous cow, Blossoms, that gave so large a quantity of milk, did not yield a large amount of butter, as it took nineteen quarts for a pound. On an average it probably takes about twelve quarts of milk for a pound of butter.

Mr. J. Leathe, of Woburn, who has some excellent cows that give rich milk, lately made an experiment, while his cows were still fed partially on hay. He measured out thirty quarts of milk, which produced seven and a half pounds of cream, (three quarts in measure,) and three pounds three ounces of good yellow butter.

As to weight, we have various estimates as the proportion of butter to milk. In all experiments of the kind, the milk should be weighed as well as the butter. Measures such as used for milk differ greatly; so much that it seems that very little reliance can be placed upon them. From statistics now before us showing the amount of butter produced, and the quantity of milk in weight and measure, in one case it is stated that sixteen and a quarter quarts of milk weighed forty-two pounds, which is two pounds nine ounces to the quart. In another case, it stated that a cow gave twenty-six quarts of milk per day, which weighed forty-seven pounds. Here is less than two pounds to the quart. Here is but a specimen of the great variations in the measures of milk, and it shows the importance of weighing, instead of measuring milk, in making experiments. [Boston Cultivator.

LETTER XVI.

DISEASES AND THEIR TREATMENT—(Continued.)

Cachectic Diseases...Hydatid on the Brain—diagnosis—common methods of treating it—treatment of French and English veterinarians...The Pelt Rot...Local diseases...Grub in the head—the nature of the disease, if one—erroneous popular opinions—location of the grub—description of the fly (*Œstrus ovis*)—method of attacking the sheep—conduct of the sheep—appearance of the larva—its habits—the chrysalis—the larva found in the heads of healthy sheep—not believed to be the cause or source of fatal disease—Mr. Bracy Clark's and Mr. Youatt's opinion—method of preventing and of expelling the grub...Scab—nature of it—habits of the *acari*—description of them—contagiousness of the disease—post-mortem appearances—treatment...Erysipelatous scab—treatment...Disease of Biflex Canal—nature and treatment...Hoof-ail—first indications—erroneous statements of foreign veterinarians—of Mr. Youatt—author's experience with it—diagnosis—chronic hoof-ail—can it be cured?—difficulties—preparation of the foot—ordinary treatment—proper treatment—cost of curing a flock—cheap partial remedies—suggestions—contagiousness of the disease—how communicated...Fouls—cause and treatment...Bronchocele or goitre—diagnosis—treatment...Miscellaneous diseases...Poison from eating Laurel—symptoms—treatment...Sore Face—cause and treatment...Loss of cud—not a disease...Hoove—cause—symptoms—cure...Obstruction of Gullet, or choking—treatment...Fractures—treatment, &c...Method of administering medicine into the stomach...Method of bleeding...The place of feeling the pulse...List of medicines employed in treating the diseases of sheep...Ale...Aloes...Alum...Antimony...Arsenic...Blue Vitriol...Camphor....Carraway seeds....Catechu....Chalk...Corrosive Sublimate...Digitalis...Epsom Salts...Gentian...Ginger...Iodine...Lard...Lime, carbonate of...Lime, chloride of...Linseed Oil...Mercury...Muriatic Acid...Nitrate of Potash...Nitrate of Silver...Nitric Acid...Opium...Pepper...Pimento...Rhubarb...Salt...Sulphate of Iron...Sulphur....Sulphuric Acid....Spirit of Tar....Tar...Tobacco...Turpentine...Verdigris...Zinc.

CACHECTIC DISEASES.

HYDATID ON THE BRAIN.—This disease, known as turnsick, sturdy, staggers, etc., is spoken of by Chancellor Livingston, and other writers of reputation, as having occurred in this country within their own observation. I have never seen a case of it, and shall be obliged, therefore, to make use of the descriptions of others. Mr. Spooner says :

"The symptoms are a dull, moping appearance, the sheep separating from the flock, a wandering and *blue* appearance to the eye, and sometimes partial or total blindness; the sheep appears unsteady in its walk, will sometimes stop suddenly and fall down, at others gallop across the field, and after the disease has existed for some time will almost constantly move round in a circle—there seems, indeed, to be an aberration of the intellect of the animal. These symptoms, though rarely all present in the same subject, are yet sufficiently marked to prevent the disease being mistaken for any other. On examining the brain of sturdied sheep, we find what appears to be a watery bladder, termed a hydatid, which may be either small or of the size of a hen's egg. This hydatid, one of the class of entozoöns has been termed by naturalists the *hydatis polycephalus cerebralis*, which signifies the *many-headed hydatid of the brain;* these heads being irregularly distributed on the surface of the bladder, and on the front part of each head there is a mouth surrounded by minute sharp hooks within a ring of sucking disks. These disks serve as the means of attachment by forming a vacuum, and bring the mouth in contact with the surface, and thus by the aid of the hooks the parasite is nourished. The coats of the hydatid are disposed in several layers, one of which appears to possess a muscular power. These facts are developed by the microscope, which also discovers numerous little bodies adhering to the internal membrane. The fluid in the bladder is usually clear, but occasionally turbid, and then it has been found to contain a number of minute worms."

According to Mr. Youatt, this disease attacks many of the weakly lambs in the English flocks. It usually appears, he remarks, "during the first year of the animal's life, and when he is about or under six months old." It succeeds a "a severe winter and a cold, wet spring."—He says :

"If there is only one parasite inhabiting the brain of a sturdied sheep, its situation is very uncertain. It is mostly found beneath the pia-mater, lying upon the brain, and in or upon the scissure between the two hemispheres. If it is within the brain, it is generally in one of the ventricles, but occasionally in the substance of the brain, and, in a few instances, in that of the cerebellum. . . . .

This is a singular disease; but it is a sadly prevalent and fatal one in wet and moorish districts. . . . . It is much more fatal in France than in Great Britain. It is supposed that nearly a million of sheep are destroyed in France every year by this pest of the ovine race. . . . .

The means of cure are exceedingly limited. They are confined to the removal or destruction of the vesicle. Medicine is altogether out of the question here."

Many barbarous methods have been adopted to rupture the hydatid, which I will not disgust you by repeating. Mr. James Hogg thrust a wire up the nostrils of the sheep, and through the plate of the ethmoid bone *into the brain*, and thus, as he assures us, punctured the hydatid and "cured many a sheep!"* This practice, which I cannot characterize otherwise than as atrocious, is justly condemned by Mr. Youatt. The dotted lines *d*, *e*, and *d*, *d*, in fig. 49, show how limited a portion of the brain could be reached with a wire or trochar by piercing the plate of the ethmoid bone—the only portion of the walls of the skull thin enough to be so pierced by a trochar introduced at the nostrils.

Mr. Parkinson "pulled the ears very hard for some time," and then cut them off close to the head! †

Where the hydatid is not imbedded in the brain, its constant pressure, singularly enough, causes a portion of the cranium to be absorbed, and finally the part immediately over the hydatid becomes thin and soft enough to yield under the pressure of the finger. When such a spot is discovered, the English veterinarians usually dissect back the muscular integuments, remove a portion of the bone, carefully divide the investing membranes of the brain, and then, if possible, remove the hydatid whole—or, failing to do this, remove its fluid contents. The membranes and integuments are then restored to their position, and an adhesive plaster placed over the whole. The French veterinarians usually simply puncture the cranium and the cist with a trochar, and laying the sheep on its back, permit the fluid to run out through the orifice thus made. A common awl would answer every purpose for such a puncture. The puncture would be the preferable method for the unskilled practitioner. But when we take into consideration the hazard and cruelty attending the operation at best, and the conceded liability of a return of the malady—the growth of new hydatids—it becomes apparent that, in this country, it would not be worth while, unless in the case of uncommonly valuable sheep, to resort to any other remedy than depriving the miserable animal of life.

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Pelt Rot—Is classified as a disease by Mr. Livingston, and various other American writers. Mr. Livingston says:

"This is often mistaken for the scab, but it is in fact a different and less dangerous disease; in this the wool will fall off, and leave the sheep nearly naked; but it is attended with no soreness, though a white crust will cover the skin from the wool which has dropped. It generally arises from hard keeping and much exposure to cold and wet, and, in fact, the animal often dies in severe weather from the cold it suffers by the loss of its coat. The remedy is full feeding, and a warm stall, and anointing the hard part of the skin with tar, oil, and butter." ‡

I have seen frequent cases of the pelt rot, but never have done anything for it, scarcely considering it a disease. If the condition of a poor sheep is raised as suddenly as practicable, by generous keep in the winter, the wool is very apt to drop off, and if yet cold, the sheep will require warm shelter.

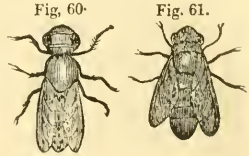
* Hogg on Sheep, p. 59.
† Parkinson on Sheep, vol. 1, p. 412.
‡ Livingston on Sheep, Appendix, p. 179.

LOCAL DISEASES.

"GRUB IN THE HEAD."—If the "grubs" found in the frontal and maxillary sinuses of the sheep actually, in any case, produce *disease*, it must be, in my judgment, by the irritation and inflammation which they induce in the mucous membrane which lines those cavities. The popular theory that the grub causes death by boring through the bony walls which surround the brain, and attacking the substance of the brain itself, is, it seems to me, utterly absurd. The only part of the skull where it could even be fancied that such a perforation would be practicable, is the cribriform plate of the ethmoid bone (11 of fig. 49,) which is very thin and is pierced with numerous small holes for the passage of nerves. But an inspection of the same figure will show that the sinus where the parasite is generally found lodged, is not in immediate juxtaposition with the cribriform plate, and that a passage from the former to the brain, would lead directly through the frontal bone—the thickest one of the whole cranium. I never saw but one grub in the cells of the ethmoid bone near the cribriform plate, and that, I judged at the time, was thrown there accidentally by the violence attending the opening of the head.* But if the grub actually penetrates to the brain, the fact would readily be disclosed after death. The full-grown grub would necessarily leave an orifice of considerable diameter through the skull. Who has seen any such orifice in the cribriform plate or elsewhere? Who has seen *any* orifice but the natural ones of the cribriform plate, *filled* with the nerves which pass through them? The farmer splits open the head of a sheep with an ax, cutting, mangling and scattering its contents, by the repeated blows necessary to effect his purpose.—Under such circumstances grubs are sometimes found scattered through all the nasal cavities—over and among the brains—and *on the ground*.—The proof is just as strong, here, that prior to opening the head, some of the grubs were *on the ground*, as that they were in the brain!

The "grub" of popular parlance is the larva of the *Œstrus ovis*, or gad-fly of the sheep. The latter is represented of the natural size in figures 60 and 61. It is composed of five rings. It is tiger-colored on the back and belly, sprinkled with spots and patches of brown. The wings are striped. The comparative proportions of the head, corslet, wings, etc. are sufficiently seen in the cuts. He who desires a full, scientific description of these insects, or who would fully investigate their habits and economy, will do well to consult the excellent monograph of them by Mr. Bracy Clark the celebrated veterinarian.

Fig. 60. Fig. 61.



SHEEP GAD-FLY.

The sheep gad-fly is led by instinct to deposit its eggs within the nostrils of the sheep. Its attempts to do this, most common in July and August, are always indicated by the sheep, which collect in close clumps with their heads inward and their noses thrust close to the ground, and *into it*, if any loose dirt or sand is within their reach. If the fly succeeds in depositing its egg, it is immediately hatched by the warmth and moisture of the part, and the young grubs, or larvæ, crawl up the nose, finding their devious way to the sinuses, where, by means of their tentaculæ, they attach themselves to the mucous membrane lining those cavities. During the ascent of the larvæ, the sheep stamps, tosses its head violently, and often dashes away from its companions wildly over the field. The larvæ re-

* The head was cloven with an *ax*! It is proper to say, however, that various writers speak of having found the grubs in the ethmoid cells, and indeed in all the nasal cavities.

main in the sinuses feeding on the mucus secreted by the membrane, and apparently creating no farther annoyance, until ready to assume their pupa form in the succeeding spring. Figures 62 and 63 give the shape and an upper and under view of the full-grown larva.

Fig. 62.

Fig. 63.

THE "GRUB" OR LARVA OF THE SHEEP GAD-FLY.

The body consists of eleven rings, colorless in the young grub, but the elevated portions growing darker with age, and becoming a dark brown when the full size is attained. There are round spots of a still darker color on each of these bands. At the edges of the rings are a few short hairs, and lower down some round darkish spots, as shown in fig. 62.—Small red spines, as shown in fig. 63, cover the space between the rings on the belly. The remainder of the body (with the exception of the posterior stigmata) is white. The tentaculæ, as well as certain appendages on each side of the anus, the purposes of which have not been discovered, are seen in fig. 63.

The larva having remained in the sinuses through the fall and winter, abandons them as the warm weather advances in the latter part of spring. It crawls down the nose, creating even greater irritation and excitement than when it originally ascended, drops on the ground, and rapidly burrows into it. In a few hours its skin has contracted, become of a dark brown color, and it has assumed the form of a chrysalis, as seen in fig. 64. Or rather, this figure exhibits the *shell* of the chrysalis, after the escape of the fly; and fig. 65 shows the upper extremity or head of the pupa, detached by the fly in its escape.

Fig. 64. Fig. 65.

SHELL OF CHRYSALIS.

The experiments of Valisnieri go to show that the *Œstrus ovis never eats*—and this is the received opinion.—The male, after impregnating two or three females, dies, and the latter having deposited their ova in the nostrils of the sheep, also soon perish.

The larva in the heads of sheep may, and probably do add to the irritation of those inflammatory diseases, such as catarrh, which attack the membraneous lining of the nasal cavities; and they are, as we have seen, a powerful source of momentary irritation in the first instance, when ascending to and descending from their lodging-place in the head. But in the interval between these events—extending over a period of several months—not a movement of the sheep indicates the least annoyance at their presence, or reveals to the veterinarian whether they exist in the sinuses or not. It would be very difficult to believe that all the local irritation which these parasites could cause, would be sufficient to terminate life, and, so far as my observation has extended, post-mortem examination discloses no lesions which would in anywise sanction such belief. The larvæ, moreover, are found, at the proper season, in the heads of nearly all sheep—the healthy as well as the diseased—and I never have been able to ascertain that the number of them is greater, on the average, in the heads of those sheep which were supposed to have fallen victims to their attacks, than in the heads of *perfectly healthy sheep* slaughtered for the table. And to prove that the popular ideas on the subject are but vague

and crude—not the result of that long and close comparison of symptoms, results, and post-mortem appearances, which would give weight to the opinions of the most unerudite—we have but to notice a few of the cases popularly referred to the "grub in the head." A sheep in the highest condition and apparent health leaps into the air two or three times, and suddenly dies, and if a grub can be found in the cavities of the head, that is the undoubted destroyer. Another wastes away for months and dies lingeringly, a mere skeleton, and the same proof establishes the same fact. Whether there has been fever or no fever—whether there has been obstinate constipation, or equally obstinate dysentery—whether one viscus or another exhibit traces of abnormal action—whether the disease has been acute or chronic—in a word, whatever the form or character of the malady—however diametrically different the diagnosis and the lesions, it is a clear case of "grub in the head," if two or three of those parasites are found there!

Mr. Bracy Clark and Mr. Youatt, so far from regarding the larva of the *Œstrus ovis* as the cause of a fatal disease, suggest that they may even *promote* the *health* of the sheep by diminishing the tendency to cerebral disease—especially determinations of blood—by establishing counter irritation! Mr. Spooner does not speak of their producing fatal effects in any instances, nor am I aware that any late scientific veterinarians do.

Treatment.—Though the presence of the grub constitutes no disease, some think it well to diminish their number by all convenient means.—One simple way of effecting this is by turning up with a plow a furrow of earth in the sheep pasture. Into this the sheep will thrust their noses on the approach of the *Œstrus*, and thus many of them escape its attacks.—Some farmers smear the noses of their sheep with tar occasionally, during the proper season—the odor of which is believed to repel the fly. Others compel the sheep to smear their own noses every week or two, by feeding them their salt sprinkled over tar. Blacklock says that the larvæ may be dislodged even from the sinuses, by blowing tobacco smoke for some moments through the tail of a pipe into each nostril. I have never tried the experiment.

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The Scab.—The scab is a cutaneous disease, analogous to the mange in horses and the itch in men. It is caused and propagated by a minute insect, the *acarus*. M. Walz, a German veterinarian, who has thrown great light on the habits of these parasites, says:

"If one or more female acari are placed on the wool of a sound sheep, they quickly travel to the root of it, and bury themselves in the skin, the place at which they penetrated being scarcely visible, or only distinguished by a minute red point. On the tenth or twelfth day a little swelling may be detected with the finger, and the skin changes its color, and has a greenish blue tint. The pustule is now rapidly formed, and about the sixteenth day breaks, and the mothers again appear, with their little ones attached to their feet, and covered by a portion of the shell of the egg from which they have just escaped. These little ones immediately set to work, and penetrate the neighboring skin, and bury themselves beneath it, and find their proper nourishment, and grow and propagate, until the poor animal has myriads of them to prey on him, and it is not wonderful that he should speedily sink. Some of the male acari were placed on the sound skin of a sheep, and they too burrowed their way and disappeared for a while, and the pustule in due time arose; but the itching and the scab soon disappeared without the employment of any remedy.

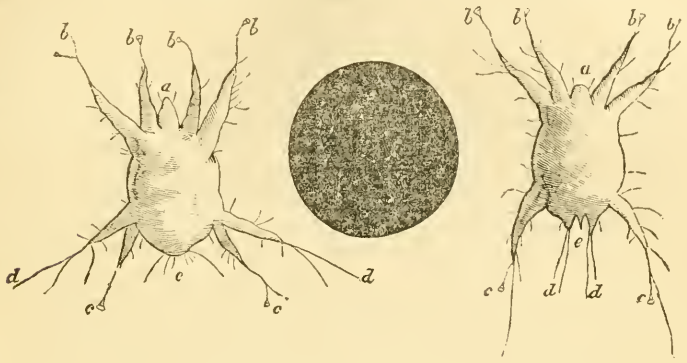
The figures on the next page are copied from M. Walz's work:

The female acarus brings forth from eight to fifteen young at a litter.

The scab is often produced spontaneously in England by mismanagement of various kinds, such as "bad keep, starvation, hasty driving, dogging, and exposure afterward to cold and wet;" and it spreads rapidly

by contagion. It is very prevalent there, and annually causes an immense loss in the wool and flesh of the British flocks. In the United States it is comparatively little known, and so far as I am able to learn, never originates spontaneously. It is a singular fact that short-wooled sheep, like the

Fig. 66. Fig. 67. Fig. 68.



THE ACARUS WHICH CAUSES SCAB.

Fig. 67.—The acari of their natural size on a dark ground.
Fig. 66.—The female of 366 times the natural size, larger than the male, of an oval form, and provided with eight feet, four before and four behind.
a.—The sucker.
b. b. b. b.—The four anterior feet, with their trumpet-like appendices.
c. c.—The two interior hind feet.
d. d.—The two outward feet, the extremities of which are provided with some long hairs, and on the other parts of the legs are shorter hairs. To these hairs the young ones adhere, when they first escape from the pustule.
e.—The tail, containing the anus and vulva, garnished with some short hairs.
Fig. 68.—The male on its back, and seen by the same magnifying power.
a.—The sucker.
b. b. b. b.—The fore-legs with their trumpet-like appendices, as seen in the female.
c. c.—The two hind-legs, with the same appendices and hairs.
d.—The rudiments of the abdominal feet.
e.—The tail.

Merino, are much less subject to its attacks, and this is probably *one* reason for its little comparative prevalence in the United States. Mr. Youatt observes:

"The old and unhealthy sheep are first attacked, and long-wooled sheep in preference to the short; a healthy short-wooled sheep will long bid defiance to the contagion, or probably escape it altogether."

It spreads from individual to individual and from flock to flock, not only by means of direct contact, but by the acari left on posts, stones, and other substances against which diseased sheep have rubbed themselves. Healthy sheep are therefore liable to contract the malady if turned on pastures previously occupied by scabby sheep, though some considerable time may have elapsed since the departure of the latter.

The sheep laboring under the scab is exceedingly restless. It rubs itself with violence against trees, stones, fences, &c. It scratches itself with its feet, and bites its sores and tears off its wool with its teeth. As the pustules are broken, their matter escapes, and forms scabs covering red, inflamed sores. The sores constantly extend, increasing the misery of the tortured animal. If unrelieved, he pines away and soon perishes.

I have never had an opportunity to observe the post-mortem appearances. Mr. Youatt says:

"The post-mortem appearances are very uncertain and inconclusive. There is generally chronic inflammation of the intestines, with the presence of a great number of worms. The liver is occasionally schirrous, and the spleen enlarged; and there are frequently serous effu-

sions in the belly, and sometimes in the chest. There has been evident sympathy between the digestive and the cutaneous systems."

Treatment.—About twelve years since, I purchased 150 fine-wooled sheep just driven into the county from a considerable distance. I placed them on a farm then owned by me, in another town, and did not see them for about three weeks. One of my men then reported to me that the sheep were amiss—that they were shedding off their wool—sore spots were beginning to show on them—and that they rubbed themselves against the fence-corners, &c. Though I had never seen the scab, I took it for granted that this was the disease. No time was to be lost, as I had 700 other sheep on the farm—though fortunately, thus far, the new comers had been kept entirely separate from them. Barely looking into Mr. Livingston's work for a remedy, I provided myself with an ample supply of tobacco and set out. The sheep had been shorn, and their backs were covered with scabs and sores. They evidently had the scab. I had a large potash kettle sunk partly in the ground as an extempore vat, and an unweighed quantity of tobacco put to boiling in several other kettles. The only care was to have *enough* of the decoction, as it was rapidly wasted, and to have it *strong enough*. A little spirits of turpentine was occasionally thrown on the decoction, say to every third or fourth sheep dipped. It was necessary to use it sparingly, as, not mixing with the fluid and floating on the surface, too much of it otherwise came in contact with the sheep. Not attending to this at first, two or three of the sheep are thrown into great agony, and appeared to be on the point of dying. I had each sheep caught and its *scabs scoured off*, by two men who rubbed them with stiff shoe-brushes, dipped in a suds of tobacco-water and soft soap. The two men then dipped the sheep all over in the large kettle of tobacco-water, rubbing and kneading the sore spots with their hands while immersed in the fluid. The decoction was so strong that many of the sheep appeared to be sickened either by immersion or by its fumes; and one of the men who dipped, though a tobacco-chewer, vomited, and became so sick that his place had to be supplied by another.

The effect on the sheep was almost magical! The sores rapidly healed, the sheep gained in condition, the new wool immediately started, and I never had a more perfectly healthy flock on my farm. Though administered with little reference to economy, the remedy was a decisive one.—With a vat like fig. 27, (Letter XII,) this would not necessarily be a very expensive method, with sheep recently sheared. But the assaults of the scab usually come on in the spring before shearing time, and it would require an immense quantity of the tobacco decoction to dip sheep with their fleeces on, however carefully it might be pressed out.

The following is the remedy recommended by Chancellor Livingston:

"First, I separate the sheep (for it is very infectious); I then cut off the wool as far as the skin feels hard to the finger; the scab is then washed with soap-suds, and rubbed hard with a shoe-brush, so as to cleanse and break the scab. I always keep for this use a decoction of tobacco, to which I add one-third by measure of the lye of wood ashes, as much hog's-lard as will be dissolved by the lye, a small quantity of tar from the tar-bucket, which contains grease, and about one-eighth of the whole by measure of spirits of turpentine. This liquor is rubbed upon the part infected, and spread to a little distance round it, in three washings, with an interval of three days each. I have never failed in this way to effect a cure when the disorder was only partial. . . . I cannot say whether it would cure a sheep infected so as to lose half its fleece."*

The following remedies are much used in Great Britain:

No. 1.—Dip the sheep in an infusion of arsenic, in the proportion of

* Livingston's Essay. Appendix, p. 177.

half a pound of arsenic to twelve gallons of water. The sheep should previously be washed in soap and water. The infusion must not be permitted to enter the mouth or nostrils.

No. 2.—Take common mercurial ointment, for bad cases, rub it own with three times its weight of lard—for ordinary cases, five times its weight of lard. Rub a little of this ointment into the head of the sheep. Part the wool so as to expose the skin in a line from the head to the tail, and then apply a little of the ointment with the finger the whole way. Make a similar furrow and application, on each side, four inches from the first, and so on over the whole body. The quantity of ointment (after being compounded with the lard) should not exceed two ounces, and considerably less will generally suffice. A lamb requires but one-third as much as a grown sheep. This will generally cure, but if the sheep should continue to rub itself, a lighter application of the same should be made in ten days.

No. 3.—Take of lard or palm oil 2 lbs., oil of tar $\frac{1}{2}$ lb., sulphur 1 lb.—Gradually mix the last two, then rub down the compound with the first.—Apply in the same way as No. 2.

No. 4.—Take of corrosive sublimate $\frac{1}{2}$ lb., white hellebore, powdered, $\frac{3}{4}$ lb., whale or other oil 6 gallons, rosin 2 lbs., tallow 2 lbs. "The first two to be mixed with a little of the oil, and the rest being melted together, the whole to be gradually mixed." This is a powerful preparation and must not be applied too freely.

Mr. Spooner gives the preference to No. 1, as least troublesome; Mr. Youatt to No. 2; and the author of the Mountain Shepherd's Manual to No. 4. I should certainly prefer No. 3, if it is, as it is asserted to be, equally effectual, for the reason that it contains no poisonous or dangerous ingredients.

An erysipelatous scab, or erysipelas, attended with considerable itching, sometimes attacks the English flocks, but I have heard of no cases of it here. This would be classified as a febrile disease. It is treated with a cooling purgative, venesection, and oil or lard applied to the sores.

—

Disease of the Biflex Canal.—From the introduction of foreign bodies into the biflex canal, or from other causes, it occasionally becomes the seat of inflammation. This is sometimes confounded with the hoof-ail, but the diseases are entirely distinct and different from each other. Inflammation of the biflex canal causes an enlargement and redness of the pastern, particularly about the external orifice of the canal. The toes are thrown wide apart by the tumor. I never have known it to attack more than one foot, and never have allowed it to go to the point of ulceration, which it is said to do if neglected. There is none of that soreness and disorganization between the back part of the toes—and none of that peculiar fetor which distinguishes the hoof-ail. I never have found it anything like so serious a disease as it is described to be by the English veterinarians.

Treatment.—I have always scarified the coronet, making one or two deeper incisions in the principal swelling around the mouth of the canal—covered the foot with tar—and paid no more attention to it.

—

Hoof-Ail.—The first symptom of this troublesome malady, which is ordinarily *noticed*, is a lameness of one or both of the fore feet. But on daily examining the feet of a flock which have the disease among them, it will be readily seen that the lesions manifest themselves for several days before they are followed with lameness. Scarcely any English writer whom I

have read, describes with respectable accuracy the first appearances of the hoof-ail as it exhibits itself *in this country, and among the fine-wooled sheep.** Mr. Youatt says:

"The foot will be found hot and tender, the horn softer than usual, and there will be enlargement about the coronet, and a slight separation of the hoof from it, with portions of the horn worn away, and ulcers formed below, and a discharge of their fetid matter. The ulcers, if neglected, continue to increase; they throw out fungous granulations, they separate the hoof more and more from the parts beneath, until at length it drops off."

The above is *not* a description of the consecutive symptoms of the hoof-ail as *I* have seen them. The hoof, instead of being softened, is perceptibly *hardened*, I think, by the presence of the disease. There is occasionally an enlargement about the coronet, but this is not common in the outset; and so far from the horn first separating from the foot at that point, it is the last place where it usually adheres when the soles are eaten away by the ulcerous matter, and the mere outside shell remains. I never have known a hoof to drop off, entire, in the sense in which I understand the closing part of Mr. Youatt's remark.

My first introduction to this disease was by its breaking out in its most malignant form in a flock of eight hundred sheep, with which I had placed, early in the preceding spring, a few valuable sheep received from abroad which were infected with the hoof-ail, without my having the slightest suspicion of the fact. The disease, when of long standing, and well kept under, shows itself but very little during the winter and spring, unless the foot is directly examined. Every sheep in that eight hundred took the disease, sometimes first in one foot, then in another, then in a third, and when the fourth one was attacked, perhaps it was again bursting out in one of the *cured feet!* I considered the sheep valuable, had much of the *esprit du corps* of a young flock-master, and was *determined* to conquer the malady at any cost and at all hazards. I have little doubt that every sheep in the flock was "doctored" on the average ten times each, and it was very rarely that I permitted *any other person than myself to cut away the horn and prepare the foot of a single sheep for the application of the remedies!* When I look back to that period—the sheep on some remote pastures—not a shed on them to shelter myself or assistants from the burning August sun as we bent ten or twelve hours a day over our task—our only "operating room" a yard in the corner of two fields—blood and pus encrusting hands and garments, and occasionally by an unlucky stroke of the knife showered over *face* and *bosom*—the crawling maggots—the intolerable fetor:—I hardly know whether to take credit to myself for or to laugh at the stanchness of my zeal. But, worst of all, with all my labor, I had

—"scotch'd the snake, not killed it!"

The disease appeared in my flock, though in a much mitigated form, the next summer. I think I then cured it—but I was not allowed to escape thus. In the succeeding summer, accident again brought it among my sheep. In a word, I have first and last served a five years' apprenticeship to combating the hoof-ail. Having seen it in every possible phase—having experimented with almost every recommended remedy not obviously empirical—I shall be excused if I speak my own opinions with a de-

* As I have before stated, when discussing "the most profitable breed for the South," the hoof of the Merino and that of the English Long-Wooled races, is essentially different. The latter usually retains its natural shape and thickness, and although the side-crust sometimes turns under, it is but a comparatively thin slip of horn, which is subsequently worn or broken off—or it is easily removed by the knife. The hoof of the Merino grows rapidly, *especially when the animal has the hoof-ail.* The horny soles will sometimes become nearly an inch thick, and the toes will elongate and turn up in front like horns, to the length of three and even four inches. The weight of the Merino is much less than that of the Long-Wool. Take these facts into consideration, together with some of the other circumstances detailed in the introductory remarks to Letter XIV, and perhaps it sufficiently accounts for some differences in the diagnosis of the disease between the two countries.

gree of confidence, even if they chance to conflict with those of professed and eminent veterinarians.

As all are aware, the horny covering of the sheep's foot extends up, gradually thinning out, some way between the toes or divisions of the hoof, and above these horny walls the "cleft" is lined with skin. When the points of the toes are spread apart, this skin is shown in front, covered with short, soft hair. The back part of the toes, or the "heels," can be separated only to a little distance, and the skin in the cleft above them is naked. In a healthy foot, the skin throughout the whole cleft is as firm, sound, *dry* and uneroded, as on any other part of the animal.

The first symptom of hoof-ail is a slight erosion, accompanied with inflammation and heat of the naked skin in the *back part* of the cleft, immediately above the heels. The skin assumes a *macerated* appearance, and is kept moist by the presence of a sanious discharge from the ulcerated surface. As the inflammation extends, the friction of the parts causes pain and the sheep limps. At this stage the foot *externally*, in a great majority of cases, exhibits not the least trace of disease, with the exception of a slight redness, and sometimes the appearance of a small sore at the upper edge of the cleft, when viewed from behind.

The ulceration of the surface rapidly extends. The thin upper edges of the inner walls of the hoof are disorganized, and an ulceration is established between the hoof and the fleshy sole. A purulent fetid matter is exuded from the cavity. The extent of the separation daily increases, and the ulcers also form sinuses deep into the fleshy sole. The bottom of the hoof disappears, eaten away by the acrid matter, and the outer walls, entirely separated from the flesh, hang only by their attachments at the coronet. The whole fleshy sole is now entirely disorganized, and the entire foot is a mass of black, putrid ulceration; or, as it more commonly happens, the fly has struck it, and a dense mass of writhing maggots cover the surface, and burrow in every cavity. The fore-feet are generally first attacked, and most usually but one of them. The animal at first manifests but little constitutional disturbance. It eats as usual. By the time that any considerable disorganization of the structures has taken place in the first foot—sometimes sooner—the other fore-foot is attacked. That becoming as lame as the first, the miserable animal seeks its food on its knees, and if forced to rise, its strange, hobbling gait betrays the intense agony occasioned by bringing its feet in contact with the ground. There is a bare spot under the brisket of the size of the palm of a man's hand, which looks red and inflamed. There is a degree of general fever—and the appetite is dull. The animal rapidly loses condition. The appearance of the maggot soon closes the scene. Where the rotten foot is brought in contact with the side in lying down, the filthy ulcerous matter adheres to and saturates the short wool, (it being but a month and a half or two months after shearing,) and maggots are either carried there by the foot, or they are soon generated there. A black crust is soon formed round the spot. It is the decomposition of the surrounding structures, and innumerable maggots are at work below, burrowing into the integuments and muscles and eating up the miserable animal alive. The black festering mass rapidly spreads, and the poor sufferer perishes, we cannot suppose otherwise than in tortures the most excruciating.

Sometimes but one fore-foot is attacked, and subsequently one or both hind ones. There is no uniformity in this particular, and it is a singular fact that when two or even three of the feet are dreadfully diseased, the fourth may be entirely sound. So also one foot may be cured, while every other one is laboring under the malady.

The highly offensive odor of the ulcerated feet is so peculiar that it is strictly pathognomonic of the disease—and would reveal its character to one familiar with it, in the darkest night.

When the disease has been well kept under during the first season of its attack, but not entirely eradicated, it will almost or entirely disappear as cold weather approaches, and does not manifest itself until the warm weather of the succeeding summer. It then assumes a mitigated form—the sheep are not rapidly and simultaneously attacked—there seems to be less inflammatory action, constitutionally, and in the diseased parts—the course of the disease is less malignant and more tardy, and it more readily yields to treatment. If well kept under the second summer, it is still milder the third. A sheep will occasionally be seen to limp, but its condition will scarcely be affected, and dangerous symptoms will rarely supervene. One or two applications made during the summer, in such a way, as I shall presently describe, that one thousand sheep can be submitted to the treatment in half a day—with but a trifle of labor and expense—will now suffice to keep the disease under. At this point a little vigor in the treatment will entirely extinguish the disease.

With all its fearful array of symptoms, can the hoof-ail be cured in its *first* attack on a flock? The worst case can be promptly cured, as I know by repeated experiments. Take a single sheep, put it by itself, and administer the remedies *daily* after the English fashion, or as I shall presently prescribe, and there is not an ovine disease which more *surely* yields to treatment. But as already remarked, in a preceding Letter, in this country, where sheep are so cheap, and labor in the summer months so dear, it would out of the question for an extensive flock-master to attempt to keep each sheep by itself, or to make a *daily* application of remedies. There is not a flock-master within my knowledge who has ever pretended to apply his remedies oftener than once a week, or *regularly* as often as that, and not one in ten makes any separation between the diseased and healthy sheep of a flock into which the malady has been once introduced. The consequence necessarily is that though you may cure the sheep *now diseased*, it has infected or inoculated others—and these in turn scatter the contagion, before they are cured. There is not a particle of doubt—nay, I know, by repeated observation, that a sheep once entirely cured may again contract the disease, and thus the malady performs a perpetual circle in the flock. Fortunately, however, the susceptibility to contract the disease diminishes, according to my observation, with every succeeding attack; and fortunately also, as already stated, succeeding attacks, *cæteris paribus*, become less and less virulent.

What course shall then be pursued? Shall the flock-master sacrifice his sheep—shall he take the ordinary half-way course—or shall he expend more on the sheep than they are worth in attempting to cure them? Neither. The course I would advise him to pursue, will appear as I detail the experiments I have made.

Treatment.—The *preparation of the foot*, where any separate individual treatment is resolved upon—and this is always necessary, at least in bad cases—is a subject of no dispute. But the labor can be prodigiously economized by attention to a few not very commonly observed particulars. Sheep should be yarded for the operation immediately after a rain, if practicable, as then the hoofs can be readily cut. In a dry time, and after a night which has left no dew on the grass, their hoofs are almost as tough as horn. They must be driven through no mud, or soft dung, on their way to the yard, which would double the labor of cleaning their feet.—The yard must be small, so they can be easily caught, and it must be kept

well littered down, so they shall not fill their feet with their own excrement. If the straw is wetted, their hoofs will not of course dry and harden as rapidly as in dry straw. Could the yard be built over a shallow, gravelly-bottomed brook,* it would be an admirable arrangement. The hoofs would be kept so soft that the greatest and most unpleasant part of the labor, as ordinarily performed, would be in a great measure saved, and they would be kept free from that dung which by any other arrangement will, more or less, get into their clefts.

The principal operator or foreman seats himself in a chair—a couple of good knives, a whetstone, the powerful toe-nippers (fig. 21, Letter XII,) a bucket of water with a couple of linen rags in it, and such medicines as he chooses to employ, within his reach. The assistant catches a sheep and lays it partly on its back and rump, between the legs of the foreman, the head coming up about to his middle. The assistant then kneels on some straw or seats himself on a low stool at the hinder extremity of the sheep. If the hoofs are long, and especially if they are dry and tough, the assistant presents each foot to the foreman, who shortens the hoof with the toe-nippers. If there is any filth between the toes, each man takes his rag from the bucket of water, and draws it between the toes and rinses it, until the filth is removed. Each then seize their knives, and the process of paring away the horn commences. And *on the effectual performance of this, all else depends.* A glance at the foot will show whether it is the seat of the diseased action. The least experience cannot fail in properly settling this question. An experienced *finger*, placed on the back of the pastern close above the heel, would at once detect the local inflammation (by its heat) *in the dark.*

If the disease is in the first stage—*i. e.* there is merely an erosion and ulceration of the cuticle and flesh in the cleft *above* the walls of the hoof, no paring is *necessary.* But if ulceration has established itself between the hoof and the fleshy sole, the ulcerated parts, be they more or less extensive, MUST BE ENTIRELY DENUDED OF THEIR HORNY COVERING, cost what it may of time and care. It is better not to wound the sole so as to cause it to bleed freely, as the running blood will wash off the subsequent application, but no fear of wounding the sole must prevent a full compliance with the rule above laid down. At the worst, the blood will stop flowing after a little while, during which time no application need be made to the foot.

If the foot is in the third stage—a mass of rottenness and filled with maggots—in the first place pour a little spirits of turpentine (a bottle of it, with a quill through the cork, should be always ready,) on the maggots and most of them will immediately decamp, and the others can be removed with a probe or small stick. Then *remove every particle of loose horn, though it should take the entire hoof*—and it *will* generally take the whole hoof in such cases. The foot should be now cleansed with a solution of chloride of lime, in the proportion of one pound of chloride to one gallon of water. If this is not at hand, plunging the foot repeatedly in water, just short of scalding hot, will answer every purpose. The great object is to clean the foot *thoroughly.* If there are any considerable fungous granulations, ("proud-flesh,") they should be excised with a pair of scissors, or the actual cautery (hot iron.)

And now comes the important question *what constitutes the best remedy?* The recommended prescriptions are innumerable. The following are some of the most popular ones.† 1. 4 oz. blue vitriol, 2 oz. of verdigris,

* A portion of any little brook might be prepared by *planking* the bottom, and widening it if desirable.
† The first three are given in the American Shepherd, pp. 379–80.

to a junk-bottle of wine. 2. Spirits turpentine, tar and verdigris in equal parts. 3. 3 quarts of alcohol, 1 pint spirits of turpentine, 1 pint of strong vinegar, 1 lb. blue vitriol, 1 lb. copperas, 1½ lbs. verdigris, 1 lb. alum, 1 lb. of saltpetre, pounded fine: mix in a close bottle, shake every day, and let it stand six or eight days before using: also mix 2 pounds of honey and 2 quarts of tar, which must be applied after the previous compound. "Two applications will entirely remove the disease," says this recipe, which was once, I believe, hawked about the country as a patent cure—being sold at five dollars to each purchaser, he giving a promise of inviolable secrecy! 4. Apply diluted aquafortis (nitric acid) with a feather to the ulcerated surface. 5. Apply diluted oil of vitriol (sulphuric acid) in the same way. 6. Same of muriatic acid. 7. Dip the foot in tar nearly at the boiling point, &c.

After a thorough trial of the above and a multitude of other prescriptions,* I have come to the conclusion that in the first and second stages of the disease—before the ulcers have formed sinuses into the sole, and wholly or partly destroyed its structure—that no application, simple or compound, is preferable to a saturated solution of blue vitriol, (sulphate of copper.) In my judgment, no beneficial addition can be made to it as a remedy. Of the manner of applying it I shall speak presently.

In the third stage, when the foot is a festering mass of corruption, after it has been cleansed as already directed, it requires some strong caustic to remove the unhealthy granulations—the dead muscular structures—and to restore healthy action. Lunar caustic I think preferable to any other application, but it is too expensive. Mr. Youatt gives a decided preference to chloride of antimony, and I think him correct. This is frequently not attainable in the country drug-stores, and muriatic acid may be resorted to, or even nitric or sulphuric acid. The diseased surface is touched with the caustic (applied with a swab formed by fastening a little tow on the end of a stick,) until the objects above pointed out are obtained. I have then usually treated the foot with the solution of blue vitriol, and subsequently coated it over with tar which has been boiled, and is properly cooled. The last protects the raw wound from dirt, flies, &c. Sheep in this stage of the disease should certainly be separated from the main flock, and looked to as often as once in three days. With this degree of attention, their cure will be rapid, and it is astonishing with what celerity the obliterated structures of the foot will be restored.

The ordinary method of using the solution of blue vitriol is to pour it from a bottle with a quill in the cork, into the foot, when the animal lies on its back between the operators, as already described. In this way a few cents' worth of vitriol will serve for a large number of sheep. But the method is imperfect, because, without remarkable care, there will almost always be some slight ulcerations not uncovered by the knife—the passages to them will be devious, and perhaps nearly or quite closed—and the solution will not reach them. Thus the disease will only be temporarily suppressed, not cured.

I had a flock of sheep a few years since which were in the second season of the disease. They had been but little looked to during the summer, and as cold weather was setting in, many of them were considerably lame—some of them quite so. The snow fell and they were brought into the yards, limping and hobbling about deplorably. This sight, so disgraceful to me as a farmer, roused me into activity. I bought a quantity

*Many of them resorted to "against the stomach of my sense," to give myself and others indisputable ocular proof of their inutility—or that they were no better than cheaper, simpler, and more easily attainable medicines.

of blue vitriol—made the necessary arrangements—and once more took the chair as principal operator! Never were the feet of a flock more thoroughly pared. Into a large washing tub, in which two sheep could stand conveniently, I poured a saturated solution of blue vitriol and water, *as hot as could be endured by the hand even for a moment.* The liquid was about four inches deep on the bottom of the tub, and was kept at about that depth by frequent additions of *hot* solution. As soon as a sheep's feet were pared, it was placed in the tub and held there by the neck, by an assistant. A second one was prepared and placed beside it. When the third one was ready, the *first* was taken out, and so on. Two sheep were thus constantly in the tub, and each remained in it about five minutes.—The cure was *perfect!* There was not a lame sheep in the flock during the winter or the next summer! The hot liquid penetrated to every cavity of the foot, and doubtless had a far more decisive effect *even on the uncovered ulcers*, than would have been produced by merely wetting them. Perhaps the lateness of the season was also favorable, as in cold weather the ulcers of ordinary virulence discharge no matter to inoculate the healthy feet, and thus, at the time of applying the remedy, there are no cases where there has been inoculation not yet followed by those lesions which admit of cure. *Whether so thorough a soaking would destroy the virus in the inoculated foot*, I cannot pretend to decide.

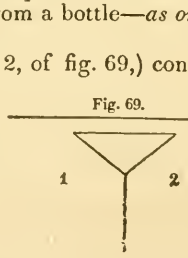
I think that the vitriol required for the above one hundred sheep was about twelve pounds, and that it cost me fifteen cents per pound. The account then would stand thus:

12 lbs. of vitriol at 15 cents	$1,80
Labor of 3 men one day each	2,25
Total	$4,05

or about *four cents* per sheep. I have not a doubt that three such applications at intervals of a week, would effectually cure the disease, as every new case would be arrested and cured before it had time to inoculate others. I have no doubt that it would do this at any time of year, and even during the first and most malignant prevalence of the contagion, PROVIDING THE PARING WAS SUFFICIENTLY THOROUGH. The second and third parings would be a mere trifle, and the liquid left at the first and second applications could again be used. Thus sheep could be cured at about twelve cents per head. This is vastly cheaper in the long run than the ordinary temporizing method—where people count the cost of a few pounds of blue vitriol, but not their time, and who thus keep the disease lingering in their flocks for years. Indeed, if partial and temporizing treatment is all that is aimed at,—if the flockmaster is content to simply keep the disease under—I can point out methods quite as efficacious as the common one by paring and applying washes from a bottle—*as ordinarily performed*—and not costing a tithe as much.

Between the corners of two sheep-pastures (1, 2, of fig. 69,) construct the dividing fence as represented in the cut. A narrow passage is thus left from one field to another. This passage should be about 2 or $2\frac{1}{2}$ feet wide and 12 feet long. The fence on each side of the passage should be an upright board fence, so that the space can be entirely filled on the bottom with a flat trough, (the bottom formed of a plank) with side and end boards about five inches high. In this trough place say a bushel and a half or two bushels of un-

Fig. 69.



slacked lime,* slack it, and then fill the trough nearly full of water.—Through this drive the flock several times from one field to the other—until the lame ones manifest much suffering. Repeat this once a week the first summer that the disease appears, putting in fresh lime each time.—This does not appear to *cure* the hoof-ail, but it keeps it under; the sheep keep their condition, and show little lameness. The second or third summer of the disease, three or four such applications usually answer for the entire season. Some use dry slacked lime, as the same trough-full will then answer for several applications. The trough in this case must have a roof over it. I never have tried the last method. If the dry lime will get sufficiently between the toes—and it is said to—it will answer the purpose where it touches more effectually than even the liquid, but it would not be so likely to penetrate into cavities. Some who use the lime remedy, pare the feet once pretty thoroughly prior to the first application, but afterward neglect them. Others neglect paring entirely, *i. e.* beyond shortening the toes once a year, as is practiced with all fine-wooled flocks.

Fig. 70.

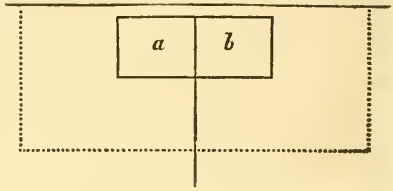


Fig. 70 is an improvement on the more common arrangement exhibited in fig. 69. The dotted lines enclose good-sized yards in the corners of two adjoining pastures.—Two drivers can yard the sheep in one of these, and drive the sheep from one to the other any number of times, without chasing them about a large field. The labor can therefore be performed much more rapidly, and it requires less force. A couple of active fellows would yard and submit a flock of two or three hundred sheep to the process in less than an hour. When the sheep are first yarded, if there are any very lame ones, draw them out and place them in one of the small pens (*a*, *b*.) Their feet can be examined, and if necessary a little extra pains taken with them, by paring, cauterizing, etc. Each sheep as treated is put into the other small pen, where it can be retained until the flock is discharged, and then removed to a separate pasture from the others, if considered desirable.

Where two yards are constructed, as in fig. 70, it is obvious that the arrangement can be made elsewhere as well as in the corner of two fields, though if the sheep are wild, it may require a few rods of wing fence (in the place of the dividing one between the fields, as seen in figures 69 and 70,) for the more convenient *cornering* of the sheep to yard them. Thus one such apparatus might be made to conveniently answer for a whole farm, though thousands of diseased sheep were scattered in different flocks over it, and may be placed at a spot where water, etc. are convenient.

Where lime and water are used, the sheep must be driven through the trough slowly and quietly—as otherwise the lime will be scattered over their wool, into their eyes, &c. If the lime is fresh burned and highly caustic, it would be likely to destroy their eyes. Indeed, pure fresh-burned lime sometimes will take the hair off from their pasterns and shanks. It is better, therefore, to use it when somewhat re-carbonized by exposure to the air.

Wood ashes are said to produce the same effect with lime. It is claimed that sheep kept on lands where the timber has been recently burned, ("new clearings,") will recover from the hoof-ail. *Query:* If this be true

* To be added to, from time to time, if the number of sheep run through is large enough to waste it materially, before they are sufficiently treated.

might not the lye of ashes, of the proper strength, make an adequate substitute for lime and water?

Some Northern farmers drive their sheep over dusty roads as a *remedy* for *hoof-ail!* Opposed as it would seem to be to sound theory—sadly as it is at variance with the practice of foreign veterinarians who employ "tow-pledgets," "gaiter boots," etc., to exclude all dirt from the diseased surface, it does actually seem in cases of ordinary virulence—especially where the disease is chronic—to *dry up the ulcers and keep the malady under!*

There is an important point to be regarded in exhibiting remedies for the hoof-ail, the mention of which I have reserved until now, as it concerns *all remedies equally.* Many farmers select rainy weather to "doctor" the sheep. Their feet are then soft, and it is therefore on all accounts good economy, when the feet are to be pared, and each separately treated, *provided* they can be kept in sheep-houses, or under shelters of any kind, until the rain is over and the grass again dry. If immediately let out in wet grass of any length, the vitriol or other application is measurably washed away. This is avoided by many, by dipping the feet in warm tar—an excellent plan under such circumstances. The tar is probably a good application at any time, but I do not consider it necessary, in ordinary cases, unless the sheep must be turned out into wet grass.

A flock of sheep which have been cured of the hoof-ail, are considered more valuable than one which has never had it. They are far less liable to contract the disease from any casual exposure—and its ravages are far less violent and general among them.

I am strongly disposed to believe that hoof-ail is propagated in this country only by *inoculation*—the contact of the matter of a diseased foot with the integuments lining the bifurcation of a healthy foot. That it is propagated in some of those ways classed under the ordinary designation of *contagion* is certain. I could indisputably authenticate more than a hundred cases, where the sheep on a farm, indeed through a neighborhood, had been notoriously exempt from hoof-ail from the first settlement of the country—so that the inhabitants did not even know what the disease was—until some diseased flock was introduced from abroad. It was so in the region where I live, and I well recollect when a flock of Saxons, driven from a neighboring county, first introduced it among our sheep. There has not been a diseased flock in the county which could not trace it back to that flock. And the contagion was spread by them as readily on our dry hill-farms as on low and moist ones.

That it may be propagated by *inoculation* I *know* by direct experiment. I have placed the matter of diseased feet on the skin lining the cleft of a healthy foot under a variety of circumstances—sometimes when that skin was in its ordinary and natural state—sometimes after a very slight scarification—sometimes when macerated by moisture. The disease has been communicated under each of these circumstances, and in a majority of all the instances, amounting to sixteen or seventeen.

That there is not even a supposed or pretended case, to my knowledge, on record where the disease has originated spontaneously, in the Northern States, I have already asserted.* I regard Professor Dick's statements of the manner in which the disease originates, which I have quoted,† as wholly inapplicable to *our country with its present breeds of sheep*, and I cannot sufficiently express my surprise that this eminent veterinarian should nave adopted—what I deem so unqualified an absurdity—the non-contagion theory.

I have been disposed to trace the propagation of the disease exclusive-

*In the beginning of Letter XIV. †Ib.

ly to *inoculation*, from having observed on my own farm and elsewhere, that healthy flocks have occupied with impunity fields adjoining those occupied by diseased ones—an open board or rail fence only separating them. I have drawn the same inference also from the manner in which the disease attacks flocks. The whole, or any considerable number, though sometimes rapidly, are never *simultaneously* attacked, as we should expect among animals so gregarious, if the disease could be communicated by simple contact, inhaling the breath or other effluvium. But not having positive and demonstrative proof of the correctness of the proposition, I would advise no man to incur any risks, unnecessarily, founded on this assumption, without first *satisfying himself* on the point.

The matter of diseased feet is left on grass, straw, and other substances, and thus is brought in contact with the inner surfaces of healthy feet.—Sheep therefore contract the disease from being driven over the pastures, yarded on the straw, &c., where diseased sheep have been, perhaps even days before. The matter would probably continue to inoculate until dried up by the air and heat, or washed away by the rains. The stiff upright stems of closely mown grass (as on meadows,) are almost as well calculated to receive the matter of diseased feet, and deposit it in the clefts of healthy ones, as any means which could be devised artificially. I do not consider it *entirely safe* to drive healthy sheep over *roads*, and especially into *washing-yards* or *sheep-houses*, where diseased sheep have been, until rain has fallen, or time has elapsed for the matter to dry up. On the moist bottom of a washing-yard, and particularly in houses or sheds, kept from sun and wind, and rain, this matter might be preserved for some time in a condition to inoculate.

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Foul.—Sheep are much less subject to this disease than cattle, but are subject to it if kept in wet, filthy yards, or on moist, poachy ground. It is an irritation of the integument in the cleft of the foot, slightly resembles incipient hoof-ail, and produces lameness. But it produces no serious structural disorganization—disappears without treatment—is not contagious—and appears in the wet weather of spring and fall, instead of the dry, hot period of summer when the hoof-ail rages most. A little solution of blue vitriol, or a little spirits of turpentine, either followed by a coating of warm tar, promptly cures it.

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Goitre or Bronchocele.—I never have seen this classed among the diseases of sheep, but the "swelled neck" in lambs is, like the goitre, an enlargement of the thyroid glands, and it is strikingly analogous to, if not identical with, that disease. It is congenital. The glands at birth are from the size of a pigeon's to that of a hen's egg—though more elongated and flattened than an egg in their form. The lamb is exceedingly feeble, and often perishes almost without an effort to suck. Many even make no effort to rise, and die as soon as they are dropped. It is rare that one lives—though three or four years since, a lamb in my flock having *one* of the thyroid glands enlarged, grew up a large, healthy sheep. At a year old, when disposed of, the enlarged gland was of the size of a goose-egg.

No inconsiderable number of lambs annually perish from this disease.—It does not appear to be an epizoötic, though I think it more prevalent some seasons than others. It does not seem to depend upon the water, or any other natural circumstances of a region, (as goitre is usually supposed to,) as it may not prevail in the same flock or on the same farm once in ten years. I never have been able to trace it to any particular kind of food. That when it does appear, it is induced by some common local or

alimentary cause, I am induced to infer from the fact that its attacks are rarely isolated. When there are any instances of it in a flock, there are usually a number of them. I have lost lambs by it two seasons—from six to ten per cent. of the whole number. Francis Rotch, Esq. of Louisville, Otsego county, lost a much heavier per centage than this (my impression would now be nearly *fifty* per cent.) of his choice South-Down lambs, a few years since. I am acquainted with various other instances where the loss has ranged from ten to twenty per centum.

When congenital goitre has thus appeared among my lambs, the ewes *have been in unusually high condition.* The same was true of Mr. Rotch's ewes, as he wrote me at the time. Whether this coëxistence implies causality, I do not pretend to decide. High condition in the ewe *may* be *one* of the inducing causes.

Treatment.—I know of no treatment which will reach the case. Indeed, the lamb is dying, almost, when born—and remedies are out of the question. Should one having the disease chance to live, it would scarcely be worth while to attempt reducing the enlargements of the glands. Perhaps keeping the breeding ewes uniformly in fair, plump, but not *high* condition, would be as effectual a preventive as any.

MISCELLANEOUS DISEASES.

Poison from Eating Laurel.—I often hear of this from our drovers, who take sheep in the spring to the Philadelphia and New-Jersey markets, through Northern Pennsylvania, on the Old Red Sandstone formation of which the beautiful *Kalmia angustifolia* is abundant. The following description of the effects on the sheep of eating this plant, and the proper remedial treatment, though, I confess, not very *satisfactory* to *me*, I extract entire from the "American Shepherd,"* as I have no experience whatever in the premises, and no better account within my reach :

"Sheep and calves will often, in the winter or spring of the year, eat greedily of the low Laurel (*Kalmia angustifolia*). The animal appears to be dull and stupid, swells a little, and is constantly gulping up a greenish fluid which it swallows down; a part of it will trickle out of its mouth, and discolor its lips. The plant probably brings on a fermentation in the stomach, and Nature endeavors to throw off the poison herb by retching or vomiting.

Treatment.—In the early stages, if the greenish fluid be suffered to escape from the stomach, the animal most generally recovers. To effect this, gag the sheep, which may be done in this manner: Take a stick of the size of your wrist and six inches long—place it in the animal's mouth—tie a string to one end of it, pass it over the head and down to the other end, and there make it fast. The fluid will then run from the mouth as fast as thrown up from the stomach. In addition to this, give roasted onions and sweetened milk freely."

I have somewhere, I think, seen drenches of milk and castor-oil prescribed for sheep poisoned with laurel; and I should, without farther knowledge of the subject, consider it treatment promising better results than the preceding.

Sore Face.—Sheep feeding on pastures infested with John's wort (*Hypericum perforatum*) not unfrequently exhibit an irritation of the skin about the nose and face, which causes the hair to drop off from the parts. The irritation sometimes extends over the whole body, though no such case has fallen under my observation. Mr. Morrel says :† "If eaten in too large quantities, it produces violent inflammation of the bowels, and is frequently fatal to lambs, and sometimes to adults."

Treatment.—Rub a little sulphur and lard on the irritated surface. If there are symptoms of inflammation of the bowels, Mr. Morrell prescribes

* American Shepherd, p. 361. † Ib. 374.

tar—"putting it into the mouth of the sheep with a flattened stick." Abundance of salt is considered, and probably truly, a preventive. I have a sheep pasture considerably infested with this difficultly exterminated weed, and I do not recollect an instance of a sheep exhibiting the effects of eating it, in several years. It is certain that my sheep have plenty of salt, whether this is the preventive or not.

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Sore Mouth.—The lips of sheep sometimes become suddenly sore in the winter, and swell to the thickness of a man's hand. The malady occasionally attacks whole flocks, and becomes quite fatal. No cases of it having been brought under my observation, I am unable to state whether, in accordance with the popular description, the lesions are confined to the lips. I should *presume not.* It is usually attributed to noxious weeds cut with the hay.

Treatment.—Mr. Morrell states that he has had the disease in his flock, and has cured it immediately by smearing the diseased lips with tar.*

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Loss of Cud.—The "loss of the cud" ranks as an important disease in the nosology of the "Cattle Doctor," and frequently calls forth all the skill of that functionary to manufacture a *new cud,* which is placed in the mouth of the animal as a *substitute for the one which was lost!* That person must be little versed in the physiology of ruminants who needs to be told that the accidental loss of one of the cuds, in the process of remastication, would be a matter of no sort of consequence. The sheep, as well as the cow, not unfrequently nearly or entirely *ceases to ruminate,* but this is the *result,* not the *cause,* of disease. It is diagnostic of all important diseases, and when observed, its warning should never go unheeded.

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Hoove.—This is not common, to any dangerous degree, among sheep, but if turned upon clover when their stomachs are empty, it will sometimes ensue. It is a distention of the paunch by gas extricated from the fermentation of its vegetable contents, and evolved more rapidly, or in larger quantities, than can be neutralized by the natural alkaline secretions of the stomach. When the distention is great, the blood is prevented from circulating in the vessels of the rumen, and is determined to the head. The diaphragm is mechanically obstructed from making its ordinary contractions, and respiration, therefore, becomes difficult and imperfect. Death soon supervenes. In ordinary cases, gentle but prolonged driving will effect a cure. Where the animal appears swelled almost to bursting, and is disinclined to move, it is better to at once open the paunch. At the most protuberant point of the swelling, on the left side, a little below the hip bone, plunge a trochar or knife, sharp at the point and dull on the edge, into the stomach. The gas will rapidly escape, carrying with it some of the liquid and solid contents of the stomach. If no measures are taken to prevent it, the peristaltic motion, as well as the collapse of the stomach, will soon cause the orifices through the abdomen and paunch not to coincide, and thus portions of the contents of the former will escape into the cavity of the latter. However perfect the cure of hoove, these substances in the belly will ultimately produce fatal irritation. To prevent this, a canula or little tube should be inserted through both orifices as soon as the puncture is made. Where the case is not imminent, alkalies have been sometimes successfully administered, which combine

* American Shepherd, p. 375.

with the carbonic acid gas, and thus at once reduce its volume. A flexible probang—or, in default of it, a rattan or grape-vine—with a knob on the end, may be gently forced down the gullet, and thus the gas permitted to escape.

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Obstruction of the Gullet, or "Choking."—After pouring a little oil in the throat, the obstructing substance can be frequently moved up or down by external manipulation. If not, it may usually be forced down with a flexible rod, the head of which is guarded by a knob or a little bag of flax-seed. The latter having been dipped in hot water for a minute or two, is partly converted into mucilage, which constantly exudes through the cloth, and protects the œsophagus from laceration. But little force must be used, and the whole operation conducted with the utmost care and gentleness, or the œsophagus will be so far lacerated as to produce death, although the obstruction is removed.

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Fractures.—Of these Mr. Blacklock concisely says :

"If there be no wound of the soft parts, the bone being simply broken, the treatment is extremely easy. Apply a piece of wet leather, taking care to ease the limb when swelling supervenes. When the swelling is considerable, and fever present, you can do no better than open a vein of the head or neck, allowing a quantity of blood to escape, proportioned to the size and condition of the animal, and the urgency of the symptoms. Purgatives in such cases should never be neglected. Epsom salts, in ounce doses, given either as a gruel or a drench, will be found to answer the purpose well. If the broken bones are kept steady, the cure will be complete in from three to four weeks, the process of reunion always proceeding faster in a young than in an old sheep. Should the soft parts be injured to any extent, or the ends of the bone protruding, recovery is very uncertain, and it will become a question whether it would not be better at once to convert the animal into mutton."

TREATMENT.

Method of Administering Medicine into the Stomach.—The stomach into which we wish to administer medicines, is the fourth, or digesting stomach. The comparatively insensible walls of the rumen are but slightly acted upon, excepting by doses of very improper magnitude. For the reasons given when the course of the food through the stomachs was described, medicine to reach the fourth stomach should be given in a state as near approaching fluidity as may be. And even then it may be given in such a *manner* as to defeat our object. Mr. Youatt says :

"If the animal forcibly gulps fluids down, or if they are given hastily and bodily by the medical attendant, they will fall on the canal at the base of the gullet with considerable momentum, and force asunder the pillars and enter the rumen; if they are drank more slowly, or administered gently, they will trickle down the throat and glide over these pillars, and pass on through the maniplus to the true stomach."

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Method of Bleeding.—Bleeding from the ears or tail, as is commonly practised, rarely extracts a quantity of blood sufficient to do any good where bleeding is indicated. To bleed from the eye-vein, the point of a knife is usually inserted near the lower extremity of the pouch below the eye, pressed down, and then a cut made inward toward the middle of the face. Daubenton recommends bleeding from the angular or cheek vein,

"——— in the lower part of the cheek, at the spot where the root of the fourth tooth is placed, which is the thickest part of the cheek, and is marked on the external surface of the bone of the upper jaw by a tubercle, sufficiently prominent to be very sensible to the finger when the skin of the cheek is touched. This tubercle is a certain index to the angular vein which is placed below. . . . . The shepherd takes the sheep between his legs; his left hand more advanced than his right, which he places under the head, and grasps

the under jaw near to the hinder extremity, in order to press the angular vein, which passes in that place, to make it swell; he touches the right cheek at the spot nearly equidistant from the eye and mouth, and there finds the tubercle which is to guide him, and also feels the angular vein swelled below this tubercle; he then makes the incision from below upward, half a finger's breadth below the middle of the tubercle."

When the vein is no longer pressed upon, the bleeding will ordinarily cease. If not, a pin may be passed through the lips of the orifice, and a lock of wool tied round them

For thorough bleeding, the jugular vein is generally to be preferred. The sheep should be firmly held by the head by an assistant, and the body confined between his knees, with its rump against a wall. Some of the wool is then cut away from the middle of the neck over the jugular vein, and a ligature, brought in contact with the neck by opening the wool, is tied around it below the shorn spot near the shoulder. The vein will soon rise. The orifice may be secured, after bleeding, as described in the preceding method.

As once before remarked, the good effects of bleeding depend almost as much on the *rapidity* with which the blood is abstracted, as on the *amount* taken. This is especially true in acute disorders. Blacklock tersely remarks: "*Either bleed rapidly or bleed not at all.*" The orifice in the vein, therefore, should be of some length, and I need not inform the least experienced practitioner that it should be made lengthwise with the vein. A lancet is by far the best implement, and even a short-pointed penknife is preferable to the bungling fleam.

Another important rule in venesection is that, where indicated at all, it should always be resorted to as nearly as possible to the *commencement* of the malady.

The amount of blood drawn should never be determined by *admeasurement*, but by constitutional effect—the lowering of the pulse, and indications of weakness. In urgent cases as, for example, apoplexy or cerebral inflammation, it would be proper to bleed until the sheep staggers or falls.

The amount of blood in the sheep is less, in comparison, than that in the horse or ox. The blood of the horse constitutes about one-eighteenth part of his weight, that of the ox at least one-twentieth, while the sheep, in ordinary condition, is one-twenty-second. For this reason, we should be more cautious in bleeding the latter, especially in frequently resorting to it. Otherwise, the vital powers will be rapidly and fatally prostrated. Many a sheep is destroyed by bleeding freely in disorders not requiring it, and in disorders which *did* require it at the commencement, but of which the inflammatory stage has passed.

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The Place of Feeling the Pulse.—The number of pulsations can be determined by feeling the heart beat on the left side. The femoral artery passes in an oblique direction across the inside of the thigh, and about the middle of the thigh its pulsations and the character of the pulse can be most readily noted. The pulsations per minute in a healthy adult sheep are set down by Gasparin at 65, by Youatt at 70, and by Hurtrel d'Arboval at 75. My own observations accord most nearly with those of Gasparin.

LIST OF MEDICINES EMPLOYED IN TREATING THE DISEASES OF SHEEP.

Ale.—In cases of debility, unaccompanied with fever, a small amount of ale is sometimes found a good stimulant. It may be given to feeble

sheep which have become unable to stand from having been too long cast —especially if they have laid on the snow, or on damp cold ground. It is sometimes given in addition to other medicine, in the place of the ordinary stimulants.

Aloes—Are occasionally used as a purgative in sheep medicine by farmers, but their use is justly condemned by all veterinarians.

Alum—Used as an astringent, but is inferior to many others.

Antimony *(The chloride or butyr of)*—the best caustic to remove fungous granulations, dead muscular structures, etc., in the last and worst stage of hoof-ail—applied with a swab or feather.

Arsenic—Employed in the proportion of half a pound to twelve gallons of water, to cure scab. An infusion of it is also used to kill ticks, &c. From its liability to adhere to vessels, or to come in contact with substances which may be subsequently eaten, it is a dangerous remedy, and one which I would never have employed on my farm.

Blue-Vitriol *(Sulphate of Copper)*—Used internally as a strong tonic, but inferior to others. Dissolved in hot water, and applied to morbid sores, an astringent, alterative, and mild caustic, of the most admirable character. It is superior to all other applications in ordinary cases of hoof-ail.

Camphor—Used with oil as an external stimulant on swellings, &c.

Carraway-Seeds—Given favorably in doses of two or three drachms, as a stomachic with other medicines.

Catechu—A valuable astringent, in doses of half a drachm. It is one of the ingredients of the celebrated "sheep's cordial," spoken of under the head of "diarrhea."

Chalk, *Prepared*, by its alkaline properties, neutralizes the acidity of the stomach, and thus checks diarrhea. It is a very valuable remedy in doses from half an ounce to an ounce, exhibited as directed under the head of "diarrhea."

Corrosive Sublimate *(Bi-chloride of Mercury)*—The most convenient form in which mercury can be exhibited internally. The *proto-chloride*, or calomel, from its great gravity, could not, with any certainty, be made to reach the fourth stomach. It would seem that mercury should be a useful remedy in several of the diseases of sheep. I have administered it only in the cases specified under the head of "malignant epizoötic catarrh," and then apparently with some benefit. It would be well if a series of careful experiments could be instituted of its value in the appropriate ovine diseases. It is very little used by veterinarians, in this country or Europe. A solution of corrosive sublimate is used for the destruction of ticks, &c., and sometimes as a wash in the scab, but its use for these purposes is liable to the same objections with that of arsenic.

Digitalis *(Foxglove)*—A sedative employed in most of the fever medicines of the English veterinarians. Dose, one scruple.

Epsom Salts *(Sulphate of Magnesia)*—In doses from half an ounce to one, and in some few cases two ounces, the best purgative which can, in almost every disease, be administered to sheep.

Gentian—Decidedly the best vegetable tonic in use. Dose, from one to two drachms.

Ginger—A stomachic and tonic, given with almost every aperient, in doses of from half a drachm to a drachm. It prevents griping.

Iodine.—The hydriodate of potash in the proportion of one part to

seven or eight parts, by weight, of lard, constitutes an ointment which is a powerful stimulant to the absorbent vessels, and therefore is an excellent application to glandular swellings, or to indurated tumors. It is a good application to the swelled udder *(q. v.)* in garget.

Lard—A mild and gentle purgative in doses of two ounces. The basis of most ointments, and applied externally in almost every case as an emollient and lubricant in the place of oils.

Lime, *Carbonate of*—Used as a caustic to run flocks of sheep through, in the "hoof-ail," *quem vide.*

Lime, *Chloride of*—An excellent antiseptic and disinfectant, and a good application to foul ulcers.

Linseed-Oil—A good purgative in two ounce doses. Preferable to Epsom salts in cases of great intestinal irritation, but not otherwise.

Mercury.—The common mercurial ointment, rubbed down with five parts of lard, for severe cases, and seven parts for ordinary cases, of scab, is an effectual cure,

Muriatic Acid *(Spirit of Salt)*—Next to chloride of antimony, the best caustic in the worst stage of hoof-ail.

Nitrate of Potash *(Nitre or Saltpetre)*—In doses one drachm, a cooling diuretic.

Nitrate of Silver *(Lunar Caustic)*—Superior to all other caustics, but too expensive for general use. For poisonous wounds, and particularly for the bite of a mad dog, it has no substitute.

Nitric Acid *(Aquafortis)*—Sometimes used as a substitute for chloride of antimony, or muriatic acid, as a caustic in hoof-ail. Used by drovers, also, to harden the soles of feet which have become thin and tender by driving. It is touched over the sole with a feather.

Opium—An invaluable sedative, and anti-spasmodic, and is employed in nearly all prescriptions for diarrhea and dysentary, and also in colic drinks. It is an important part of the "sheeps cordial." It is commonly used in the form of a tincture, or laudanum. Dose, one drachm.

Pepper, *Black*—Given in small quantities in milk, to new-born lambs, when chilled.

Pimento *(Allspice)*—A substitute for ginger, in the same doses, but not so valuable.

Rhubarb—Unites the properties of a cathartic and subsequent astringent. In small doses it is a tonic and stomachic, invigorating the digestion. When the bowels are relaxed and torpid, and the stomach in a feeble state, it would seem the most appropriate purgative, when a purgative is indicated.

Salt *(Muriate of Soda)*—An ounce constitutes a purgative; in small quantities a tonic and stomachic. The necessity of keeping sheep freely supplied with salt has been referred to under Summer and Winter Management.

Sulphate of Iron *(Copperas, or Green Vitriol)*—Used in washes for the hoof-ail, but superseded by sulphate of copper. Internally, a tonic.

Sulphur, *Flower of*—In doses of from one to two ounces, a good aperient. It is the basis of various ointments.

Sulphuric Acid *(Oil of Vitriol)*—A powerful caustic, used as a substitute for the acids already alluded to, in the worst stage of hoof-ail.

Spirit of Tar—Destroys maggots, and repels the attack of flies. Flies will not approach a part over which it has been smeared.

Tar—Is a valuable application to the feet, nose, back of the horns, &c., under the various circumstances detailed in Summer Management, and in the treatment of grub in the head, hoof-ail, &c.

Tobacco—An infusion of it destroys vermin, and also is a cure for scab, *quem vide.*

Turpentine, *Spirits of*—Prevents the attack of flies, and drives away maggots. It is a useful application to old sores, wounds, &c.

Verdigris *(Acetate of Copper)*—Used in hoof-ail; but adds nothing, I think, to the good effects of the sulphate of copper.

Zinc, *Carbonate of*—Mixed with lard, constitutes a valuable emollient and healing ointment. It is mixed in the proportion of one part of the carbonate, by weight, to eight of the lard.

Mistake Corrected.—It was incidentally stated in the March Number of this Journal, that we had been informed that Mr. Gowen, of Germantown, Pa., had lately refused $500 for 500 bushels of Irish Potatoes. He assures us that our informant was mistaken, and that he would be unwilling to be considered as speculating in an article of food. We regret not getting his correction in season for the April Number, and in the mean time have apprized him of the source of our information, which was given, doubtless, under some misapprehension on the part of our informant.

Fruit-Trees, Grafting, &c.—In that valuable periodical, The Horticulturist—valuable, as might be inferred, from being conducted by Mr. Downing—there is an exceedingly impressive and interesting paper from Mr. Turner, on the subject of the vital power and longevity of fruit and timber trees, which goes far to explain facts and phenomena, that have been generally observed but not understood. We shall take an opportunity of transferring Mr. Turner's letter, with Mr. Downing's commentaries, to the pages of The Farmers' Library. For the American agriculturist who aspires to be respectably well informed in his profession, what subject more pleasing, and at the same time more necessary to be studied, than the principles of Physiology as applicable to trees which his houses and, in the greater part of the country, his fences are to be built; and from which his table is to be supplied with successive fruits, if *supplied at all!* But how many live and die on farms of hundreds of acres, enjoying less variety of fruits than is picked up in large towns, after 10 o'clock, by the scavengers of the market!

Potato-Rot—*Another Promising Experiment.*—We promised to be done with this subject until something new and promising should turn up. Such seems to be the experiment related by Senator Naill, of Maryland, a steady and zealous friend of Agriculture.

He supplied a neighbor with potatoes for planting, who carefully planted the sets from three to four inches deep, in drills about eighteen inches apart, covering them carefully with straw from three to four inches deep, except a small portion that was purposely left uncovered by way of experiment. The covering of straw prevented the growth of weeds and superseded the necessity of cultivation. The result was an excellent crop of sound potatoes, so far *as they were covered.* Those left *uncovered suffered with the rot.*

—"Had it not been for the last six words," said Mr. Skinner, "he would not have troubled the gentlemen present by reading this extract—nor, but for that, would Mr. Naill have made the communication—because it would have remained questionable whether the crop would not have been sound *without the covering!*—and this he took to be the sort of matter-of-fact practical information which New-York farmers and all other agriculturists wanted, and which it would become all Agricultural Clubs to send abroad, instead of mere generalizations."

HOUSEWIFE'S DEPARTMENT.

CATHERINE OF LIVERPOOL.

Among the many females in humble life who have been exemplary for their extraordinary perseverance under difficulties, their ingenious industry, and their self-sacrificing benevolence, a poor woman now living in an obscure situation is deserving of being placed in the foremost rank. This heroine in humble life—whom we shall describe under the name of Catherine or Kitty, by which she is usually known to her friends—was born in a populous village in Lancashire about the year 1786. Her parents, who were in poor circumstances, happened to become favorably known to an infirm and venerable lady, who kindly took Catherine home to stay with her as a humble companion and servant. By this humane lady she was taught to read, and trained not only to early habits of neatness and order, but to the knowledge as well as the practice of Christian dispositions and duties.

Although this lady had only a moderate income, she spent not a little on the poor, whom she likewise encouraged with her advice in cases of difficulty, and cheered with her presence in distress. When she became too feeble to walk to the houses of her neighbors, she was occasionally carried out in a sedan-chair, her little servant walking by her side. Catherine afterward used to describe these expeditions to her friends: "The old lady would say to me, Catherine, I am going out; and then she would be carried out in her sedan. She was too lame to walk, and could not easily get into a coach. I used to take a little basket and go by her side. We would soon stop at a cellar, into which she sent me to see how the poor woman was; and when I had come out again, she would say, How does she look? Is there any fire in the grate? Is there any coal in the house? Then she would send me for anything that was wanted. And when we had come home, she would say, Go put your feet upon the fender, and dry them, and tell me what you think of what you have seen. Then she would say, Catherine, poverty will probably be your portion: but you have one talent which you may use for the good of others. You may sometimes read half an hour to a poor sick neighbor. You may read a chapter of the Bible to her when she could not read it herself; or you may run errands for those who have no one else to go for them. Promise me, then, my child, that you will try to do what you can for others, and I hope we may meet in another world. Ah! there were few like my dear mistress."

This lady having died, her household was broken up, and Catherine returned to her family. She could not, however, be kept at home; and as no suitable place in domestic service could be obtained for her, she was sent with her brother to work at a cotton mill in a village at some distance. This was in the year 1798, when she was only twelve years of age. That a child so youthful should have been dispatched to such a scene of labor may excite surprise, but only in those who are in the habit of considering all factory systems as injurious, if not tyrannical. Many may be bad enough, but those conducted in country districts, and under good management, are, on the whole, not unfavorable to health or morals. The mill to which our young heroine and her brother were committed was one of the better regulated class. The hours were not long, and were precisely fixed. All had their appointed duty, which, if they attended to, no complaint was made. There was an open airing-ground for recreation in good weather, and a library from which books were given freely out to those who chose to read. Great care was likewise taken to prevent any impropriety of behavior. In short, nothing was wanting to render the attendance agreeable, or to encourage the diligent and orderly. In this mill Catherine passed a few years, improving in health and intelligence, though without distinguishing herself from the mass of her companions. Perhaps, however, she excelled in the propriety of her deportment, from the instructions she had received from her old mistress; and her good feelings prompted her to be grateful for the care taken of her, as well as others, at the mill. She has often been heard to say, "If ever there was a heaven upon earth, it was that apprentice-house, where we were brought up in such ignorance of evil; and where Mr. Norton, the manager of the mill, was a father to us all." It is to be wished that every one who takes the charge of a child, whether as a pupil, an apprentice, or a servant, should feel it a duty to do what may be done early, to establish the principles and practice of virtue, and to deserve such grateful recollections as those of our heroine.

Mr. Norton did not see Catherine after she quitted his establishment, and never probably was aware of the beneficial influence he had exerted on her mind; yet it was by the course of discipline and instruction in the cotton factory that her character was formed during the most susceptible and dangerous season of her life.

Catherine left the cotton mill to go to service in a family. The lady of the house was a very good manager, and a good mistress; knew what a servant's duty was, and took care that it was well done. In her family, Catherine's habits of diligence, order, and fidelity were strengthened. Everything she saw there tended to advance her education. *And is it not the true idea of education, that it comprehends all the daily and hourly influences, small as well as great, of the circumstances by which we are surrounded, and which are constantly acting upon us; bearing upon thought and feeling, and every spring of action within us? It is beginning to be understood, that whatever acts upon our powers for their growth, or decrease, or direction; whatever acts upon desire, appetite,*

or passion, to excite or to repress it, to gratify or disappoint it; and whatever, either directly or indirectly, goes to the excitement and formation of dispositions, sentiments, principles, and habits, is to be viewed as a part of education. In this view of the subject, it is not a question whether children or men shall or shall not be educated. Education is constantly going on with every individual, old and young, from the first to the last hour of life, because every individual is, in every hour and every moment, acted upon by the circumstances amid which he is placed: and because the influence of these circumstances upon him will be in accordance with the tastes and desires he is forming or has formed, the principles he is adopting or has adopted, and his strength or weakness in the application of principles to conduct. The child at home is educated far more by the examples which he sees than by the lessons which he learns; and his mind is educating with far freer and stronger tendencies in his plays and in the streets, than in school and under the eye of his master.*

Catherine was one of the most cheerful and faithful of servants. The pleasure with which she was accustomed to render any assistance to her fellow-servants was ever a matter of remark; and through this disposition, joined with a habit of accurate observation, she laid up a large stock of knowledge, which has since been invaluable to herself and others.

We have now to view Catherine in quite a new sphere of life. She was married to a person deserving of her affection, but not until she had received a promise that she should be permitted to take her mother home to live with her, for she was now old and infirm. A small house was taken and furnished, and the marriage promised every prospect of happiness. This might be called a bright gleam in Catherine's existence. When she had become the mother of two children, her husband died, and, to add to her troubles, her mother became blind and insane.

Catherine's case may now be considered to have been deplorable—a widow, the mother of two children, one a new-born infant, no means of subsistence, and with a superannuated and blind parent depending upon her. Some women in such circumstances, would have sat down and wept, pined in sorrow, or gone to the workhouse. Catherine had a soul above all this.—She acutely felt the blow, but she also knew that it was a dispensation of Providence which ought to be borne. When the first emotions of distress were passed, she courageously yoked to the task of supporting her dependent family.—Catherine despised to eat the bread of idleness.

Worth never wants friends. Catherine's case excited pity among her neighbors, and her good character secured her a respectable wet-nursing. She refused to leave home for this purpose, and the baby was committed to her charge. By this means, and a trifle of wages owing to her husband, she contrived to live over a year. Now she behooved to face the world. The difficulty of obtaining work was at this time very great. There was much suffering among the operatives throughout the country, and among all who depended upon their daily labor for subsistence. The only employment of which Catherine could procure an offer was work at a nail factory, for which she was not well fitted. However, she gladly availed herself of it, because the work was paid according to the number of nails made, and she could absent herself to give a brief attendance on her mother and children. The employment was hard, and poorly paid. She generally wrought at large nails, of which she was able to make about eight hundred daily; but of the same kind some men can make double that number. Her earnings were, on an average, fifteenpence per day; yet, though small, they were still precious to her, because they were her own earnings. No one knew better than herself how to receive a favor, or how to confer one; but she would not willingly accept the means of support from another, when she could obtain them by her own industry. She has been known to work in this factory till her fingers were blistered, and she could do no more; she would then remain at home, and poultice them till they were sufficiently recovered to enable her to resume her work. She and her mother at that time often suffered from hunger. Her necessities were known to a kind friend, whose own means were small, but who yet contrived occasionally to furnish her with a good meal. Through this friend she sometimes obtained a supply of flowers or bouquets, by the sale of which she provided for her wants when she had no other means of obtaining subsistence.

In expedients like these she passed some years, during which the insanity of her mother was at times so outrageous as greatly to endanger any who had the charge of her; Yet this charge she could not relinquish. She would not hear of the removal of her parent to a place of confinement. No labors and no sufferings could weaken her filial reverence and affection. At length, however, it became necessary for her mother's own safety that she should be in the charge of those more competent to the task of restraining her, and she was removed to the work-house. But the heart of the devoted daughter was still with her; and from week to week Catherine strained every nerve, and straitened herself in every way, that she might regularly carry to her mother all the comforts she could procure. Nor were her trials those only of the early death of her husband, and the long insanity of her mother. Her eldest son was a severe sufferer from his birth till the age of twenty, when he died. It is hardly to be conceived how much she did and endured for this boy. For weeks together, after a hard day's work, she was up through the whole night, kneeling by him, that he might have his arms around her neck for support, because he was unable to lie down. Her patience and love seemed to be inexhaustible, and the strength which she exerted through her afflictions almost miraculous.

The lad was a dutiful and affectionate child. He had a heart like his mother, strong both to love and to endure. For a time Catherine seemed hardly able to sustain his loss. She could not sleep, and with difficulty could take even the smallest portion of food. Her inability to sleep awakened the desire to pass her nights with the sick; but she found this recalled the memory of her son too strongly, and she did not persist in it. Desirous to fill the vacuity in her house, she now, to use her own expression, "inquired for some family who wanted a person to take care of some *tedious* children." Her sur

* These are important truths very clearly expressed, and cannot be too deeply impressed on the minds of all parents. [*Ed. Farm. Lib.*

viving child often gave her great pain. He exhibited strong indications of inheriting the insanity of his grandmother, having at times an ungovernable wildness of manner; yet, when not under excitement, he was an amiable, kind, and obedient boy.

When Catherine worked in the nail factory she formed a friendship with another woman who also worked there. This poor creature afterward became blind and helpless. She had for some time previously been greatly disabled, and Catherine had never failed to do what she could for her. But now she took her to her own house, and for seven years supported her entirely. She carried her up-stairs at night, and brought her down in the morning. At length, when her son became so ill that she could not leave him, and her means of support were wholly unequal to the increased expense, she sent her blind friend to the work-house; yet her interest in the poor sufferer never declined.—Her care for her was like that of a mother for a child. She never omitted once a week to send her a little tea and sugar, that she might not be made uncomfortable by the want of these accustomed gratifications. It happened that this poor blind woman had a son in the work house who was a cripple, and nearly an idiot. The child was dear to his mother; and when she took her tea she gave him a part of it. This became one of his highest gratifications; and after the death of his mother, he was greatly distressed by the loss of this indulgence. Catherine, therefore, promised him that while she lived she would bring him tea and sugar, as she had brought them to his mother; and she kept her word. On one occasion a friend called upon Catherine, and found an old woman with her who had a number of small parcels in her hand. On noticing these parcels, she informed the visitor that they contained a little tea, sugar, and snuff, and that they were for a woman in the work-house nearly a hundred years old.—"She knew my parents," said Catherine, "and I dare say assisted my mother when she needed; so it is just a little acknowledgment. There are other old persons there to whom I would be glad to send something, if I had the means."

After Catherine left the nail factory, she supported her family by mangling, a benevolent gentleman in the neighborhood, who was struck with her character, having assisted her to purchase a mangle at a sale of effects. By means of it and a little charring work she lived for several years, till her mother died, when she had no longer an inducement to remain in the place; and she removed with her only surviving son to Liverpool, where she was fortunate in getting him some small employment suited to his infirmities. She took her mangle with her, and therefore we have now to follow her to one of the humblest dwellings in a back street of that large town. Here she labored, struggled to keep up a good name, and to do all the good she could do within her sphere. On one occasion a poor woman, a Mrs. O'Brien, came into the neighborhood to look for lodgings, but could nowhere obtain a room. "She must not die in the street," said Catherine. Yet what was to be done? Catherine lost no time in answering this question. The door of her house was opened, and Mrs. O'Brien and her children at once found a home there. In a fortnight this woman died; but poor as she had been, her heart was bound up in her children, and her great solicitude in death was for them. With the full sympathies of a mother, Catherine promised to do for these children as if they were her own; and this promise she has faithfully fulfilled.

Another Irish woman, Bridget M'Ann, was a common beggar. Her appearance indicated extreme distress, and no inconsiderable disease.—Yet she was unwilling to go into the infirmary, because she would there be separated from her children. Catherine visited this woman, gained her confidence, persuaded her to allow her eldest boy to be put into the work-house, and took the youngest, about two years old, under her own charge. She nursed this child carefully, sent some of her own clothes to the mother, and took a change of clothes to her every week. Yet for all these kind offices she had scarcely any other return than reproaches and complaints. The clothes, it was said, were not well washed, nor was anything done for her as it should be done. But Catherine was neither to be fatigued by service nor discouraged by ingratitude. She felt the claims of weakness, ignorance, and suffering in this poor beggar far more strongly than she felt any injury to herself. She kept the child for some months, till the mother reclaimed it; and then gave up her charge only because she was allowed to hold it no longer. It is only from such facts that one knows how much the poor often do for the poor.

After a few years' residence in Liverpool, Catherine's son died, which was a sore grief to her, for she was now alone in the world, and had no longer any one of her own family to love. To fill up the vacancy, she gladly took charge of three children from a widower, a respectable man in the neighborhood, who engaged to pay her twelve shillings per week for their board. She, however, had not long had the children under her roof, when the health of the man failed, and he was unable to earn the amount he had agreed to pay her. So anxious, however, was he to do what he could in payment for the relief and comfort he had received that he was actually at his work on the week in which he died. Catherine kindly waited upon him on his death bed, and though he professed a different form of religious belief from her own, brought him, unasked, a clergyman of his own persuasion. She said "she thought people always go fastest to Heaven on their own road." On his dying bed this poor man besought her to retain the charge of his children. She gave him her word that she would; and she admirably performed her promise. After a time the youngest boy was placed in a charity school, where she maintained a faithful supervision of him: and when he left it, she fitted him out for sea, and has still the care of him whenever he returns from a voyage. The girl she kept two or three years, till she found a good place for her. And the eldest boy, owing to the failure of the master to whom he was apprenticed, has for several years been, and still is, a considerable expense to her. He is now indeed at a trade, but he has so small wages that he is obliged to look to Catherine for much of his means of living. A fellow-apprentice earned only four shillings a week. His own father refused to keep him for so small a sum. The anxiety and grief of his mother were extreme, and she applied to Kitty upon the subject, who told the mother that on condition of the good conduct of the boy, she would receive him into her family.

At the first appearance of cholera in England, great anxiety was manifested to guard against

it, and cleanliness was especially enjoined.—The habits of the very poor, and their few conveniences, made the washing and drying of clothing and bedding very difficult Catherine's house at this time consisted of a small kitchen, a little parlor, two or three chambers, and a small yard at the back of the house. In the kitchen she had a copper. She fastened ropes across the yard, and offered her poor neighbors the free use of them and her kitchen for washing and drying their clothes. She also took charge of clothes and bedding which were lent for the use of the poor. So apparent was the benefit derived by the families who availed themselves of Catherine's kindness, that a benevolent society was led to provide a common cellar where families might wash every week.

The establishment thus begun has been found so useful that it is still maintained. In cases of cholera fever, medical men are accustomed to send a note with the clothes used by a patient, or when a change of linen is required; hired washers being employed for the service of the sick. This plan made neighbors willing to lend clothes and bedding, since no risk of contagion was incurred. During the second year of the cholera, one hundred and forty dozen clothes for men and women, one hundred and fifty-eight sheets, thirty-four beds, sixty quilts, and one hundred blankets,were washed in this establishment in one week.

The cholera principally attacked the heads of families, especially those who were in a state of exhaustion from fatigue or want of food. It frequently happened that the sufferers had neither food nor fuel, while the rigorous quarantine led to a dearth of employment. Catherine divided her own stores as far as she could with the sufferers around her. A supply of oatmeal was given her, and with this she made porridge every morning for a number who would otherwise probably have had no breakfast; and at one time she thus supplied sixty with daily food. A neighbor every evening went three miles into the country for the milk for this porridge.

Wherever the disease appeared among those who knew Catherine, her presence and aid were felt to be of high importance. The physicians were quite unable to meet the calls that were made upon them. She therefore went to them for advice, administered the remedies which were prescribed, and carried back her accounts of her patients. It seemed impossible that she should obtain rest either night or day. She found a vacant room, on the floor of which she could spread some bedding, and there she provided a lodging for families in which death had occurred, and whose rooms, it was thought, should be vacated for a time, that they might be purified. One of the first cases of cholera occurred in the street where Catherine lived.—A widower, with two young children, boarding with a poor woman, was taken suddenly ill, and died. To prevent unnecessary exposure to the disease, the attending physician directed that the body should be buried unwashed. A report of this got abroad, and a crowd assembled about the house, threatening violence if the body were not washed before it was buried. Catherine undertook to address the assemblage —"We should be very sorry to do anything wrong," she said to them, "but the physician has forbidden that the body should be washed, on account of the danger of infection. Now, this man who has died is no more to us than he is to any of you. Mrs. R——— and I have done our part by laying out the body; and if any one of you will come in and wash it, we will provide everything that is necessary for you." The crowd dispersed quietly and quickly, and the body was buried unwashed.

The deaths and sickness of so many parents by cholera left a large number of destitute children, too young to go to school, and who were therefore running about the streets. Catherine could not overlook these children. She collected about twenty of them into her house, and a neighbor, who lived on the opposite side of the street, offered to assist her in the care of them. This neighbor amused the children by singing to them, by telling them stories, and by teaching them to repeat hymns. The number of the children soon became too large to be comfortably accommodated in Catherine's little dwelling. It was resolved, therefore, to form them into a scoool. The infant school thus begun was adopted by the managers of one for older children in the same street; the neighbor who aided Catherine became the mistress. and obtained a comfortable maintenance from the employment she had begun in benevolence.

A being with such a universal spirit of charity and love, and with such self-imposed claims and duties, required to eke out her means by every plan which seemed available. To make the most of her house, small as it was, she received lodgers, and to make their evenings pass agreeably, she borrowed books and newspapers, and proposed that one should read aloud for the general entertainment. She provided a good fire in the winter, well knowing this comfort often tempts even a sober man to an alehouse. She permitted her lodgers to invite their acquaintance; and during the winter of 1835, as many as ten met and subscribed for three different cheap periodicals, and to the Mechanics' Library. As some of the party were carpenters' apprentices, an older workman gave them instruction in their business before their reading began. One of these young men begged Catherine to speak to four of their fellow-workmen, who spent the money at alehouses which they earned by working over-hours. She did so, telling them if they would come every night to her house, they should have the use of a good fire and a newspaper, and for sixpence a week she would provide a supper.

This poor woman seems to have had an eye to everything. One day, in passing a shop, she saw a great boxfull of waste paper, including many damaged and used Bibles. These she was allowed to pick out and buy for a mere trifle. When she brought her parcel of Bibles home, she fastened the leaves, patched up the covers, and then lent them to sailors who were going to sea. It was afterward ascertained that by this act the characters of several were improved. It may be matter for surprise how Catherine earned enough to accomplish so many good deeds. But cheerful and persevering labor, with rigorous economy, will do wonders. She still lives, and is a credit to her station, showing, in all her undertakings, a remarkable power of making much of slender means. Her economy with regard to both food and clothing is admirable.—Nothing is wasted. She has been known to stew fish-bones into broth for the sick poor, and from the refuse of fruit to make a pleasant drink for fever patients. Time is also, in her estimation, a thing not to be thrown away. and therefore every moment of her waking existence is devoted to the execution of some useful object.

The owner of the house in which Catherine lives is a single lady, and a cripple, with a very

small income. Catherine's consideration of these circumstances is beyond all praise. She expresses her unwillingness to apply to her poor landlady even for necessary repairs, and as far as possible has made those repairs herself. She buys paint, and paints her rooms with her own hand. She receives payment from her lodgers on Friday, and the sum, though only a few shillings altogether, she lends to some poor woman who purchase certain goods which they sell in the market on Saturday, and make their returns to her on Saturday night. It does not appear that she has ever thus lost anything, while the gain has been of considerable importance to those who have made it. She has mixed but little with her neighbors, except for such offices of kindness as she could render to them; and most unwillingly asks for any aid for her own personal friends.

We must, however, draw our account of this poor widow to a conclusion. She is not without faults; as, for instance, hastiness of temper; but her anger is soon appeased, and no ill usage can check her kindness, except for a very short time. She has experienced injustice; and though she has felt it strongly, has acknowledged that it was a duty to forgive others, when there is so much to be forgiven in ourselves. She was ever most careful not to incur a debt, maintaining her sense of duty on this subject with an energy worthy of all praise. Had she been embarrassed by debt, she could have carried through few of her benevolent intentions. Her whole history presents a striking combination of simplicity with energy, sensibility with forethought, calculation, and economy, with disinterestedness and self-sacrificing benevolence. To a pious reliance on Providence she unites a vigilant sense of practical duty, an indifference to all selfish considerations, and a strong faith in her fellow-creatures, in herself, in good principles, and in TRUTH.

PRICES CURRENT.

[*Corrected, April* 26, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort, '47-8 ℔ 100 lb	6 —	@—	—
Pearls, 1st sort, '47-8	7 75	@ 7	87½
BEESWAX—American Yellow	— 20	@—	22
CANDLES—Mould, Tallow.. ℔ lb.	— 11	@—	13
Sperm	— 31	@—	32
COTTON—From ℔ lb.	— 5½	@—	7½
COTTON BAGGING—Kentucky	— 15½	@—	16
CORDAGE—American ℔ lb.	— 11	@—	12
DOMESTIC GOODS—Shirtings, ℔ y.	— 4½	@—	9
Sheetings	— 6	@—	15
FEATHERS—American, live	— 35	@—	37½
FLAX—American	— 9½	@—	—
FLOUR & MEAL—Genesee, pure, bbl.	6 37½	@—	43¾
Genesee, from Western Wheat	6 12½	@ 6	25
Troy	6 —	@ 6	25
Oswego	6 06¼	@ 6	18¾
Michigan	6 25	@—	31¼
Ohio	— —	@ 6	25
Brooklyn and New-York	6 —	@ 6	18¾
Brandywine	— —	@—	—
Georgetown	6 12½	@ 6	25
Baltimore, Howard-street	6 12½	@—	—
Richmond City Mills	— —	@—	—
Richmond Country	— —	@ 6	12½
Alexandria	— —	@ 6	12½
Fredericksburg and Petersburg	— —	@—	—
Rye Flour	3 50	@ 3	75
Corn Meal, Western and State	2 25	@—	—
Corn Meal, Jersey	2 37½	@—	—
GRAIN—Wheat, White ℔ bush.	1 35	@ 1	40
Wheat, Red and mixed	1 30	@ 1	35
Rye, Northern	— 73	@—	—
Corn, Jersey and Northern yel	— 52½	@—	53
Corn, Southern, yellow	— 53	@—	—
Corn, Western, flat yellow	— —	@—	—
Oats, Northern	— 44	@—	47
Oats, Jersey	— 40	@—	42
HAY—North River in bales, ℔ 100 lb	— 50	@—	60
HEMP—American, dew-rotted.. ton	135	—@140	—
" " water-rotted	160	—@190	—
HOPS—1847	— 6	@—	7
IRON—American Pig, No 1	30 —	@—	—
" Common	26 —	@27	50
LIME—Thomaston ℔ bbl.	— 75	@—	77
LUMBER—Boards, N.R., ℔ M. ft. clr.	35 —	@ 40	—
Boards, Albany Pine ℔ pce.	— 10	@—	19
Plank, Georgia Y. Pine. ℔ M. ft.	27 50	@30	—
Staves, White Oak, pipe, ℔ M.	60 —	@—	—
Staves, White Oak, hhd.	45 —	@—	—
Staves, White Oak, bbl.	33 —	@35	—
Staves, Red Oak, hhd.	28 —	@32	—
Hoops	27 —	@32	—
Scantling, Eastern	17 50	@20	—
Scantling, Oak	30 —	@35	—
Timber, Oak ℔ cubic foot	— 22	@—	25
Timber, White Pine	— 18	@—	22
Timber, Georgia Yellow Pine	— 30	@—	35
Shingles ℔ bunch	2 50	@ 2	75
Shingles. Cedar, 3 feet, 1st quality.	28 —	@34	—
Shingles, Cedar. 3 feet, 2d quality.	27 —	@32	50
Shingles, Cedar, 2 feet, 1st quality.	20 —	@25	—
Shingles, Cedar, 2 feet, 2d quality.	18 —	@22	—
Shingles, Cypress, 2 feet	18 —	@22	—
Shingles, Company	35 —	@38	—
NAILS—Wrought, 6d to 20d ℔ lb.	— 8	@—	13
Cut 4d to 40d	— 4	@—	4½
PLASTER PARIS—℔ ton	2 50	@—	—
PROVISIONS—Beef, Mess, ℔ bbl.	7 62½	@ 8	75
Beef, Prime,	4 62½	@ 5	62½
Pork, Mess, Ohio	9 87½	@10	—
Pork, Mess, Ohio, new	— —	@—	—
Pork, Prime, Ohio	8 25	@ 8	37½
Pork, Prime, Ohio, new	— —	@—	—
Lard, Ohio, prime ℔ lb.	— 6¾	@—	7¾
Hams, Pickled	— 5¾	@—	6
Hams, Smoked	— 6¾	@—	7¾
Shoulders, Pickled	— 3¾	@—	4
Beef Hams in Pickle	12 —	@12	50
Beef, Smoked ℔ lb.	— 8	@—	—
Butter, Orange County Dairy	— 23	@—	27
Butter, Western Dairy	— 18	@—	20
Cheese	— 7½	@—	8½
SEEDS—Clover, new ℔ lb.	— 6¾	@—	7
Timothy ℔ tierce	20 —	@25	—
Flax, Rough, in bulk bush	1 30	@ 1	33
SOAP—New-York ℔ lb.	— 4	@—	7
TALLOW—American Rendered	— 8½	@—	9
TOBACCO—Virginia @ lb.	— 3½	@—	7
Kentucky and Missouri	— 4	@—	8½
WOOL Am. Saxony, Fleece, ℔ lb.	— 40	@—	45
American Full Blood Merino	— 35	@—	38
American ½ and ¾ Merino	— 31	@—	33
American Native and ½ Merino	— 27	@—	30
Superfine, Pulled, Country	— 29	@—	30

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ORIGIN AND PROGRESS OF OUR COTTON MANUFACTURES.

LIFE OF S. SLATER.

If, as we maintain, the welfare of society plainly suggests that he most deserves the public esteem and the rewards of a free Government, whose genius devises new and productive employments for labor, then should grateful testimonials be bestowed on such men as he whose life is briefly sketched in the following pages. The trio of great men to whom our country is indebted for countless millions of wealth, and very much of that development and growth which is without parallel elsewhere in the world, may be said, as far as these have resulted from *manufacturing power*, to consist of Eli Whitney, Cartwright, and Slater, the subject of the following notice. It gives us pleasure to preserve memoirs of such men, as well from an impulse of unaffected gratitude, as because we deem them entertaining and suitable reading for the sons of our friends in the country. And why not for their fathers? says the reader. Only because, for our life, we cannot divest ourselves of the idea, more than half the time, that we are writing for *young people*. Why, we hardly know; but so it is. We deem our space very precious, and endeavor so to fill it with useful things that we sometimes apprehend our pages may wear a sombre cast that may be almost forbidding. We shall take room for no farther preface than to ask the reader who here sees the rise and progress of the Cotton Manufacture in the United States, beginning at so late a period, to bear in mind that, for the *number of spindles*, the United States is already the third country in the world, England being the first and France the second. Of the 27,585,000 spindles of which we have accounts from all countries, England drives a 634-1000th part of them; the remainder of Europe 272-1000th parts, and the United States 91-1000ths. In 1846 the net gain to the labor of England, on her Cotton Manufacture, was about $70,000,000. We were going to ask if the same weight of Cotton were manufactured in this country, under free and easy associations of small capitalists, as in New-England, where the operative is often a stockholder of the establishment in which he works, how much more of these net profits would remain to the laborer, and how many of these seventy millions would be divided among our own cultivators of butter, and cheese, and milk, and onions, and apples, and potatoes, and beef, and mutton, and eggs, and chickens, and cabbages? But we have not space here to push these reflections. Yet, is it not

clear that if we had in all the old States *consumers alongside of the producers* in proportion to their extent and resources, as they have in Massachusetts and, Rhode Island, would not all their exhausted land be resuscitated, and their rich lands be ditched and drained and improved, and all their lands rise in value? Let the farmer, then, instead of being forever content to be made the hack-horse of office-hunting politicians, inquire why is it that this cannot be so? Let him first buy and read Carey's book, "The Past, the Present, and the Future." One word more: suppose a few thousand dollars to be offered by the Government, every year, as premiums to the first importers of labor-saving machinery in all our industrial employments—the originality and value of it to be judged, and the premiums to be awarded by such men as Professors RENWICK and JACKSON, and Col. GADSDEN, Gen. MCNEILL, JAMES S. WADSWORTH, EDWARD STEVENS, and others eminent for attainments and experience in the various departments of Industry, both in science and in practice—would not thousands thus held out, result, when applied, in greater benefit to the substantial interests of the country than the millions that are now expended in life salaries to supernumerary officers—in soldiers, garrisons, guns, powder, &c. &c. ?—But enough, for the present. As long as you, Farmers, dare not speak for yourselves, or support even one paper that does, how can you expect mere politicians, looking for the spoils, to speak or to act for you?

It is to be remembered that Sir Richard Arkwright took his first patent for an entirely new method of spinning cotton yarn for warps in 1769, at which period his first mill was put in operation at Nottingham, in England, and his second mill, which was much larger, was erected at Cromford, Derbyshire, in 1771. After which, his mode of spinning by water-frames extended rapidly all over the kingdom; so that during the period when the most persevering exertions were being made by various enterprising individuals, in different parts of the United States, to improve and perfect this most important manufacture, England was enjoying all the benefit of Arkwright's patents, by means of which cotton yarn was produced at much less expense and of a superior quality to any that had ever been made by machinery before that period; and, at the same time, the British Government were using every means in their power to prevent models or drawings of these machines from being carried out of the country. Every effort to erect or import this machinery into the United States had hitherto proved abortive. Much interest had been excited in Philadelphia, New-York, Rhode Island, and Massachusetts, but they found it impossible to compete with the superior machinery of England.

Such was the state of the cotton manufacture in the United States in 1790; every endeavor to introduce a proper system of spinning had been fruitless; and nothing but the introduction of the water-frame spinning, which had superseded the jennies in England, could have laid a foundation for the successful prosecution of the business in America, and that was happily accomplished by one

who was personally and practically acquainted with the business in all its details. The individual here referred to was Mr. Samuel Slater, who has justly been called the *Father of the Cotton Manufacture of America.*

Mr. Slater was born in the town of Belper, Derbyshire, England, on the 9th of June, 1768; and when about fourteen years of age, he was bound apprentice, at Milford, near Belper, to Jedediah Strutt, Esq., (the inventor of the Derby ribbed stocking-frame, and for several years a partner with Sir Richard Arkwright, in the cotton-spinning business.) At that time Mr. Strutt was erecting a large factory at Milford, where Slater continued to serve him for some time in the capacity of clerk; but, during the last four or five years of his apprenticeship, his time was solely devoted to the factory as general overseer, both as respected the making of the machinery, and in the manufacturing department. After having completed the full term of his engagement, viz., six and a half years, he continued for some time longer with Mr. Stuart, for the purpose of superintending some new works that were then erecting. His design in doing so was to perfect his knowledge of the business in every department, as previous to this time his thoughts had been directed to America by various rumors which had reached Derbyshire, of the anxiety of the Governments of the different States in that country to introduce and encourage manufactures. A newspaper account of a liberal bounty of £100 having been granted to a person who succeeded in constructing a very imperfect carding-machine for making rolls for jennies, and the knowledge that a Society to Promote Manufactures had been authorized by the same Legislature, finally de-

termined him to try his fortune in the Western Hemisphere.

He embarked at London for New-York, on the 13th of September, 1789, and landed at the latter on the 17th of November, after a passage of sixty days. He was, immediately after his arrival, introduced to the New-York Manufacturing Company: but, finding that the state of their works did not suit his views, he left that place in the January following for Providence, R. I., and there made arrangements with Messrs. Almy & Brown to commence operations for spinning cotton entirely upon his own plan. On the 18th of the same month, the venerable Moses Brown took him out to Pawtucket, *where he commenced making the machinery, principally with his own hands;* and on the 20th of December, 1790, he started three cards, drawing and roving, together with seventy-two spindles, entirely upon the Arkwright principle, being the first of the kind ever operated in this country. These were worked by the water-wheel of an old fulling-mill in a clothier's building, in which place they continued spinning about twenty months, at the expiration of which time several thousand pounds of yarn were on hand, notwithstanding every exertion was used to weave it up and sell it.

Early in 1793, Almy, Brown and Slater built a small mill in the village of Pawtucket, in which they put in operation seventy-two spindles, with the necessary preparation, and to these they gradually and slowly added more and more, as the prospects became more encouraging. After a short time, besides building another factory, they considerably enlarged the first.

Such, then, were the circumstances under which the Arkwright mode of spinning was introduced into this country, and such was the individual to whom belongs the entirement of its introduction.

Mr. Slater's business was so prosperous that about the year 1806 he invited his brother, Mr. John Slater, to come to this country, who, in all probability, brought with him a knowledge of all the most recent improvements made by the English spinners. The now flourishing village of Slatersville, in Smithfield, was then projected, in which John Slater embarked as a partner, and in June of the same year removed to Smithfield as superintendent of the concern. In the spring of 1807, the works were sufficiently advanced for spinning, and up to the present time they have been under the management of that gentleman, in an uninterrupted state of improvement. This fine estate was owned, in equal shares, by four partners, but now wholly belongs to John Slater and the heirs of his brother.

Cotton-spinning, according to the preceding statements, commenced in the then obscure village of Pawtucket, in 1790, at which time only twenty-two spindles were put in operation.

Previous to 1815, the whole weaving in the United States was done by hand-looms, in many of which considerable improvements had been made, and great quantities of cloth were manufactured for home consumption. About 1814, a Mr. Gilmour landed in Boston from Glasgow, with models or patterns of the power-loom and dressing-machine, whom Mr. John Slater invited to Smithfield, and made known to him his wishes to construct these important machines: but not being able to prevail on the whole of the partners to engage in the business, Mr. Gilmour remained some time in Smithfield, employed as a mechanic, where he introduced the hydrostatic press, which proved to be of great advantage in pressing cloth, &c.

Judge Lyman, of Providence, had been endeavoring to construct a power-loom, but failed in the attempt. On hearing of Mr. Gilmour, he, with some other gentlemen, entered into a contract with him to build a power-loom and dressing-machine, from the patterns he had brought from Great Britain, which he did, to the great satisfaction of his patrons, from whom he received a compensation of 1,500 dollars. These machines were soon after introduced into Pawtucket, where David Wilkinson commenced making them for sale. Gilmour was a man of great mechanical genius, but neglected to turn his talents and opportunities to the advantage of his family, and consequently, on his death, they were left in poor circumstances.

The hand-looms were soon superseded by the others, the introduction of which greatly aided in extending the business in this country, and has enabled the American manufacturers to compete with Great Britain, in South America, India, and some other foreign markets.

But what is your warrant, says the agricultural reader, for appropriating so much space, that should properly be given to practical farming, to an exposition of the origin and growth of manufacturing industry and the agency and celebrity of an individual, however enterprising, who laid the foundation of it?—Though this is a very natural question, it seems to us that a very simple answer will suffice; and this is it:

Look, for a moment, at Virginia and Rhode Island: Virginia has employed in agricultural production, 318,771 persons; these are *producers.* Now, within her borders she has, as consuming *non*-producers of agricultural products, 54,147, or about six producers for one consumer. Now look at Rhode Island,

and there contemplate the fruit of a policy which fostered the enterprise of this Father of her manufactures. She has 16,617 agriculturists, and within her bosom non-agricultural producing consumers of the fruits of her fields, and orchards, and gardens, 21,271, or nearly *three consumers for one producer!*— And again: while 1,239,797 people of Virginia, have, as customers, manufacturers the annual value of whose products is only $8,349,218; the 69,110 people of Rhode Island have among themselves the capital and the citizens producing to the value of $8,640,626. And again: while the Virginia farmers have to travel with their produce over a surface of 61,000 square miles, to find and supply their consumers, who produce these $8,349,218, the Rhode Island agriculturists find the customers who produce a greater value of manufacturing within 1,200 instead of 61,000 square miles! Thus the Virginian must, in the average and aggregate, travel over 60 times the space. If time is money, as it must be with every industrious man who deserves to be called a man, is it not important that he should effect his exchanges, that is, sell and buy, in the smallest space and in the shortest possible time, that he and his wagons and horses may be improving his machine of production at home, instead of wearing out his wagons and teams, and wasting his manure and his substance on the road, in the work of exchange, which eats up half his produce? The time that he spends on the road, the Rhode Islander, having brought the consumer to his door, spends on his farm—pruning his orchards, soiling his cows, planting his potatoes, digging, ditching and draining, and filling his barn-yard with muck, &c. Ask you, then, what benefit it is to the farmer to show him the effects of a policy which makes men congregate instead of scattering? And as for the brief memorial of Mr. SLATER, has the reader of the Journal yet to learn that we deem such men far more worthy of honor, and of being held up to the emulation of our young men, than all mere warriors, from Genghis Khan down to Abd-el-Kader.

SHEEP DOGS.

DOG LAWS—THE PROTECTION OF SHEEP FROM DOGS.

A FRIEND writes us from Columbia, S. C., that he has lately again "lost upward of one hundred sheep by the depredations of sheep-killing curs. It has quite disheartened me. We must have a dog law."

We have repeatedly before referred to this intolerable nuisance in the South—sheep-killing dogs. What a practical exemplification is above presented of the extent of the evil! One of the most spirited improvers of Agriculture in South Carolina—a gentleman who has been at much pains and expense to introduce improved breeds of sheep into that State—finds himself in a night robbed of his property—arrested in his career of improvement—"disheartened," perhaps, from making any future efforts.

Is South Carolina willing to throw away the benefits of Sheep Husbandry—recently *demonstrated* in our pages to be of such incalculable utility to her—all to enable individuals of a very peculiar taste, to say the least of it, to surround themselves with an army of vagrant, worthless curs, to eat up their masters' and other men's property?

We agree with our correspondent: South Carolina, and every other Southern State, require a dog law stringent enough to reduce the number of dogs to the actual wants of the people. What should be the provisions of such a law we cannot so well determine. The owner of a dog would be liable at Common Law for the depredations committed by it. But the owners of many of them—of the very ones which would be the most likely to go *from home* in quest of food—would not be pecuniarily responsible. So this remedy would amount to nothing.

In Col. Randall's Letters on Sheep Husbandry in the South, Vol. II., p. 472, the following abstract is given of the dog laws of New-York:

In New-York it is provided by law that every bitch over three months old shall be taxed $2; every additional one owned by the same man $5; *two* dogs over six months old $1; every additional one $3. The avails of these taxes constitute a fund out of which Supervisors of Counties are to pay for any sheep slain by dogs whose owners are unknown.

Any person may kill any dog "which he shall see chasing, worrying or wounding any sheep," unless by direction of the owner of the sheep.

The owner or *possessor* of any dog, on being notified "of any injury done by his dog to any sheep, or his dog having chased or worried any sheep," must within 48 hours kill his dog, or forfeit $2 50, and the farther sum of $1 25 for every 48 hours, unless "it shall satisfactorily appear to the Court that it was not in the power of such owner or possessor to kill such dog." (Revised Statutes of New-York, vol. i. chap. xx., title xvii.)

It seems to us that the planter or farmer ought to have legal power to kill any dog found in his fields, or lingering about his premises without his owner—or to kill a strolling dog anywhere, unless wearing a collar with the master's name on it. In the North, this is a privilege usually taken by sheep farmers, without any legal enactments. A strolling dog not recognized, and not pursuing his journey in the highway, or not crossing inclosed land in pursuit of game, finds short shrift and a bullet. We see nothing wrong in this. Self-protection demands it. It is difficult to detect curs killing sheep, and to identify them, as their depredations usually take place in the night. It is difficult to shoot them in the night or to trace them home. With a properly enforced taxation of dogs, it might not be so necessary; but before this is done, and until this is done, we advise that the least lenity comporting with propriety, be shown to vagrant and strolling curs.

The most efficient protector of sheep by night and day, undoubtedly, is to be found in some of the larger races of the sheep dog—those which will at once seize upon and kill any dog which molests the flocks under their charge. We have at various times alluded to these several races—and they will be found described with considerable minuteness in Letter XVII. (in the present number of this Journal) on Sheep Husbandry, with portraits of several of the varieties.—The large Mexican sheep dog—descended from the Spanish—for a union of sagacity, fidelity and power, has no superior. His charge are entirely safe from curs, and even wolves. If a few of these could be purchased and sent home by our victorious troops, they would be of incalculable advantage to the wool-growers of our country.

G. W. La Fayette has in training a pair of the shepherd's dog, such as is generally used and most esteemed in France, to be sent along with a couple of the Pyrenean Wolf dog breed, to the Editor of The Farmers' Library, and destined for the use of Col. Hampton, whose flock affords the best mutton from the pastures in February, without any extraordinary keep. His flock of several hundred, we once heard him remark, had not eaten ten dollars' worth of grain in a year. If the Southern agriculturist who has read the ample and well-digested

Letters of Col. H. S. Randall, in this Journal, does not have recourse to sheep and wool growing as an important resource, to which that region is demonstrated to be well adapted, it will not be for want of ample advice and illustration. These Letters and their author have all the requirements of experience, judgment, scholarship and character to recommend them.

MORE LAST WORDS ABOUT THE POTATO DISEASE

(From the American Journal of Agriculture and Science, conducted by C. N. BEMENT.)

Knowing no one better, if so well, qualified to throw light on this subject, where that light is to be reflected by Science, as Mr. TESCHEMACHER, the author of the following, we take leave to transfer it from the highly respectable medium in which we find it to our pages:

I had intended to remain altogether silent in future on the subject of the Potato Disease, for it is impossible to reply to assertions and arguments used by Editors of Agricultural Periodicals, themselves possessing not the least practical or personal knowledge on the subject, such as—"Everybody has given up the *fungus theory* now," and "There is nothing new on the subject of the Potato Disease, except that all the nostrums proposed have failed." Equal loss of time would it be to discuss experiments tried on a row or two of potatoes in a garden with salt or with fifty incongruous mixtures, one ingredient of which might destroy the action of the other—or if any one had succeeded, it would be impossible to say to which his success was owing. I have tried salt in my own garden on potatoes, and have never had a single diseased tuber, but I never thought to bring this forward as a decisive experiment.

A mutual friend whom I highly esteem has urged me strongly to write a few lines to you on the subject; I therefore beg to state:

That the microscopic observations made by me in the autumn of 1845, and communicated then to the New-York State Agricultural Society, at their own request, have been confirmed in 1846 and 1847 by scientific Commissioners and Committees in almost every country in Europe.

That a great many experiments have been tried with salt on large breadths of land, and in a large proportion of these the potatoes have been completely saved, while all around were diseased. That this remedy has failed in some cases in being a complete protection, is all well known to me, but even here the proportion of diseased potatoes was much less than where salt had not been used. The cause of this is very evident: I have always stated that the salt must be in contact with the disease to effect its destruction. Now let any one consider in a tenacious clayey soil, or in one of a light gravelly nature, how easily this contact may accidentally fail. My conviction is more firm than ever that the cause of this disease is a fungus, propagated by clouds of invisible spores, (seeds,) which settle in some places and not in others, just as the wind listeth or bloweth, and that wherever they come into contact with salt, when they settle down they cannot vegetate. A heap of diseased potatoes from two to three acres will give sufficient spores to infect a district five hundred miles square; these spores only ripen and become dry enough to live and float in the atmosphere toward the middle of the summer, and then take some time to settle and vegetate; every fungus collector knows that the latter end of the summer is the most favorable period for these minute productions; from this we see the reason why the earliest planted potatoes are generally the freest from disease.

A paper has appeared within the last few days from Dr. Klotsch, of Berlin, Prussia, detailing a new method for strengthening the potato, and increasing its chance of escaping disease. This new method is the old practice called by gardeners *stopping*, and has been practiced by them time out of mind, on cucumber, melon, pelagonium and almost all plants; it consists in pinching out the top of a shoot, thereby encouraging it to throw out lateral branches, and become strong, bushy and fertile. This is a dangerous process in unpracticed hands, as if the stopping is continued a little too long the potato would not ripen, and if begun too early would materially injure the plant; it would probably be much too expensive in point of labor in this country.

I hope this communication will answer your purpose, and I take the opportunity of stating that I am quite tired of the subject, and will not be moved by any consideration to engage in farther discussion thereon—let those who choose, try salt as a remedy, and the other leave it alone.

Boston, 8th April, 1848.

In confirmation of the above we find the following communication in the Mark-Lane Express of the 17th of April, 1848:

POTATO DISEASE.—*Sir:* In the spring of 1847, I was advised by a neighbor to sow agricultural salt broadcast on the ground intended for potatoes, before it was prepared for the crop, after the rate of a peck to five square yards of land. I did so, and the crop proved a very good one, and has kept free from blemish or any particle of disease, throughout the winter to this time. On some ground adjoining I omitted to sow any salt, and the potatoes grown thereon were scabby and diseased. I came therefore to the conclusion that salt is a preventive of the disease, and I send these facts to you for the benefit of the public. A FARMER.

Hurst Green, Sussex, April 13.

Written for the American Courier.*

CHRONOLOGY AND CURIOSITIES OF AGRICULTURE;

WITH PRACTICAL SUGGESTIONS.

BY JOHN S. SKINNER.

Founder of "The Turf Register," and "American Farmer," and Editor of "The Farmers' Library."

WHAT ARE THE IMPEDIMENTS TO THE IMPROVEMENT OF AMERICAN AGRICULTURAL INDUSTRY?

A THOROUGH discussion of this subject, in an Agricultural Society, or elsewhere, would probably result in the conclusion that the greatest impediment is the want of a *more enlarged and comprehensive system of education, adapted to the condition and pursuits of the agriculturist.* With such a system, every art and every industry of the country would be meliorated and advanced. The cultivators of the soil, in gaining knowledge, would gain power—power in the management of their own means and faculties, and their just share of influence over the action of the Government. The state of their Agriculture, and the estimation and political power of those who follow it, are the best possible tests of the state of civilization in all countries. The Earth is the great producing machine, after all, and in a national and rational point of view, all other pursuits and machinery are beneficial in proportion as they contribute to the improvement of the great machine of production on which all classes depend for their occupation and bread.

No great substantial and pervading amendment can be realized except from and along with a broader and better digested system of education in reference to the working and use of this great machine of production—mother Earth. If farmers submit to the appropriation of eighty cents in every dollar of the taxes levied on them, for the support of military establishments, Army and Navy Schools among the rest, why do they not compel their Representatives to demand something, if only in the way of commencement, for *Agricultural Schools?* Will any man say that Science cannot do as much for enlightening and rendering more efficient the use of the plow, as it can and has done for that of the cannon and the sword? And as to Constitutional power over the subject, if Uncle Sam can turn Editor and book-publisher, sending out his 150,000 volumes annually, in rivalry and destruction of the Agricultural Press of the country, may he

* A family newspaper of the largest size and of deservedly popular character—so much so that its increasing circulation now ranges above sixty thousand—Andrew McMakin, Editor and proprietor; price $2 a year; published in Philadelphia It is highly illustrated, and its contents so various that he must be more cynical than Diogenes or the Bachelor of the Albany himself, who does not find in it something highly entertaining. A column like the articles here transferred to our pages is every week given for the amusement and instruction of agricultural and horticultural readers.

not turn schoolmaster also? Has he not power to disseminate information in one form as well as in another?—for it is but a choice in the manner of coming at the same object, only that he happens to choose the least instead of the most efficient and durable means. In his Patent-Office Report he gives merely the statistical *facts*, instead of the scientific principles—shows agricultural results, instead of establishing institutions for teaching how the best results are, under all circumstances, to be realized.

LIME, USED WITHOUT KNOWLEDGE AND ABUSED WITHOUT REASON.

There are few things about which practical farmers have more differed, or been more puzzled, than about the efficacy and value of *Lime*—some affirming it even to be worthless, others regarding it as the great panacea for all the ills that afflict the husbandman. For much of that diversity of experience and opinion, Mr. Norton, of Yale College, the accomplished Professor of Chemistry, as applied to Agriculture, thus briefly and readily accounts:

"I would not for an instant be thought to undervalue practical experience; its results have been great and important, and in many cases Science has only followed to explain what Experience has before discovered. But the process of discovery by experiment alone, is always painfully slow, because the experimenter has no clear perceptions to guide him. In many cases, errors and inexplicable differences of opinion arise, because results of an opposite character are obtained by individuals in the same neighborhood.

"I once attended a meeting of a Farmers' Club in Ayrshire, Scotland, where the subject of discussion was Lime. All were from the same neighborhood, and all used lime, but scarcely any two agreed in their estimation of its effects. Some considered it one of the most valuable manures employed, and others condemned it entirely. The discussion was perfectly unsatisfactory in its termination, each person being only confirmed in his own opinion. The true explanation of their differences consisted in the fact, that the soils of their district were derived from the decomposition of *two species of rock*, the one of which *abounded in lime*, while the other was *almost entirely destitute*. This was a case in which experience gave no information as to the course most advisable in individual cases. Expensive experiments were necessary in each instance, and after all this expenditure of time and money, no general or useful result was arrived at. But on the other hand, theory alone is almost as objectionable as practice alone. Results obtained in the laboratory, or on paper, are by no means to be considered as applicable to practice until tested by experience. Ignorance of this fact has led some of the most eminent philosophers into deplorable errors, and has caused many practical men to regard scientific Agriculture as but another name for quackery. The only true course is to unite practice and theory, guiding and explaining each by the other. The utmost possible advance would then be made in both directions, because all experiments would be for definite ends and guided by clear, intelligent views.

"When we attentively consider the principles which I have now endeavored to present in a connected form, we perceive that they are not only simple, intelligible and practical, but also beautiful. That endless chain which joins the dead earth to the living plant, the plant to the animal, and the animal to the earth again, is even sublime in its unceasing series of changes."

We may add that we have known farmers who have, in the beginning, been most charmed by the effects of lime, who afterward began to doubt, and at last condemned it as an exhauster. This has been because they have looked to it to supply *everything;* and when their lands have been exhausted of other things necessary to the growth of their crops, instead of supplying these other things, they have turned indignantly and unjustly upon the lime, because it has not continued to do what it never could and never promised to do. All this is explained by that eminent and profound agricultural writer, Von Thaer, and by others.

WHAT SCIENCE IS DOING FOR AGRICULTURE IN ENGLAND.

The reader may form some idea of this, when it is seen that chemical investigation has undertaken to determine, with confidence, and with an accuracy sufficient for all useful purposes, the *quantity of food necessary to produce one pound of flesh, and the cost of its production*, according to English prices. This last we omit, on account of the difference between English prices and ours, leav-

ing every reader to ascertain the cost, according to the value of the food in his own neighborhood, or on his own estate:

25	pounds of milk furnish	*one pound of flesh.*		9	pounds of oatmeal furnish	*one pound of flesh.*	
100	.. of turnips	..	..	7 1-10	pounds of barley-meal	..	..
50	.. of potatoes	..	..	7 4-10	.. of bread	..	..
50	.. of carrots	..	..	7 4-10	.. of flour	..	..
4	.. of butcher's meat, free from fat or bone, furnish 1 lb. of flesh			3 1-2	.. of peas	..	..
				3 2-10	.. of beans	..	..

Table showing the approximative value of various kinds of food as fuel to sustain animal heat:

4	lbs. potatoes contain 1 lb. carbonaceous fuel.			1 1-2	lbs. oatmeal 1 lb. carbonaceous fuel.		
10	lbs. carrots	..	..	1 9-10	.. beans	..	..
1 1-2	lbs. flour	..	..	1 9-10	.. peas	..	..
1 1-2	.. barley-meal	..	..	2	.. bread	..	..
11 7-10	.. turnips	..	..	11 9 10	.. milk	..	..

MODE OF CULTIVATING CELERY.

The trench must be made, and the bottom of it well manured with old farm-yard manure, in the usual way; a day or two after the celery is planted let a man walk on each side of the plants, just measuring the length of his foot on each side; then slack 4 lbs. of guano in 30 gallons of water, stirring it well every 3 or 4 hours for 24 hours. This will be about the quantity for 20 yards of celery, which must be gently put on immediately around the plants. In a day or two, a slight sprinkling of salt may be put on the plants and on the earth about. The slight salting may be repeated every 10 or 12 days. When the plants are sufficiently grown to be earthed, repeat the guano as above, previously, after earthing, treading the plants on each side. After this, no more guano must be used, but every 12 or 14 days a slight sprinkling of salt must be repeated. Celery is very fond of soap-suds, and so it is of salt. Hence we find it growing spontaneously along the salt-water shores of the Patuxent and of West River, at high-water mark.

JEWISH MODE OF SLAUGHTERING CATTLE.

This mode is so humane and considerate that for that, if nothing else, the disgraceful impediments and liabilities which prevent their full enjoyment of all political rights ought to be expunged and done away with forever. A sharp knife—so sharp, in fact, that the least notch in the blade would render it unlawful to use it for the purpose, is drawn across the throat of the beast, which causes instantaneous bleeding to death. The rabbinical laws as to the smoothness of the blade are remarkably stringent, lest any bluntness may cause the animal unnecessary pain.

SPRING WHEAT.

THERE is assuredly an opening for a farther trial of Spring Wheat than has been made in our country. It might offer a means of escaping the fly, and afford employment for labor and for land, that could not be conveniently put in requisition in autumn.

We find the following remarks at a late meeting of the Royal Agricultural Society of England. Ought not measures to be taken by Societies and Institutes to import all the highly recommended varieties of wheats, and the seeds of new grasses and vegetables abroad? Suppose they should, in general, not prove valuable, yet in a single case, ample compensation might be found.

Of what avail is an ostentatious display of *translations* at Farmers' Clubs about new varieties of the "*cruciferæ*," if no measures are taken to import them or their seed for practical trial and use by those whose peculiar business it is to do it, and who have in their hands, lying idle in "5 per cent. stocks," ample means, placed there by a generous and confiding public?

Bearded Wheat.—Mr. Halcomb, of Poulton, near Marlborough, reported to the Council the success with which he had cultivated a new variety of Bearded Spring Wheat, adapted for soils not suited to barley, or for late sowing after turnips, from seed furnished to him by Mr. Elliot, of Jedburgh, in 1840, originally obtained from Mr. Dickson of Hawick, by whom it had been introduced into Scotland from Russia. Mr. Halcomb put a portion of this seed into the ground on the 18th of March, and the remainder into an adjoining piece of the same land on the 3d of April, after a crop of turnips fed off by sheep, and plowed for seed early in March. The earlier sown was reaped on the 15th August, and the later sown on the 18th of the same month, having begun also at the latter date to reap his autumn-sown Wheat.—Apparently there was no difference in these crops; but on threshing them the produce of the autumn sown proved to be only thirty-three bushels per acre, while that of the spring sown was forty bushels. He had sown this new spring variety every year since, and had generally the same quantity per acre as from the autumn-sown Wheats. He had never found the crop deficient, excepting when he had been unable to get a fine tilth, after feeding off turnips with sheep, with a subsequent dry summer. In a trial last spring, Mr. Halcomb grew in the former case, from two bushels of seed per acre, thirty-two bushels; and, in the latter, from three bushels of seed per acre, on the adjoining ridge and sown at the same time, forty bushels of grain, which proved, to his surprise, of superior weight by 7 lbs. per sack. He had never grown more than forty-one bushels per acre of this wheat, but he had been told by other parties of their having grown, on superior land, forty-eight bushels, and in one instance, fifty-six bushels. The price of this new variety in Devizes market was usually rather above that of the autumn Wheats. Mr. Halcomb conceived that its greatest advantages would be found in its suitableness for soils subject to blight. The last season, on land where the autumn wheats were scarcely worth cutting, the "April" Wheat, to which Mr. Halcomb then called the attention of the Council, was estimated at forty bushels per acre. He thought also, that from its early maturity it would be found serviceable for making good deficiencies of plant in the autumn sown. The Council ordered their thanks to be returned to Mr. Halcomb for the favor of this communication.

ARTIFICIAL MANURES.

It would seem by the following, which we cut from a late Mark-Lane Express, that we have yet much progress to make before we come up with the farmers of England in the preparation of substitutes for barn-yard and other ordinary manures:

Subjoined are the present prices of several sorts of manure:

Agricultural salt 30s. per ton.
Alkalies 28s. and 42s. per cwt.
Boast & Co.'s (Bow) inorganic manures, from 6s. to 11s. per cwt., according to crop.
Boast's guano £9 9s. per ton.
Carbon 12s. per qr.
Chie fou 21s. per cwt.
Chloride lime 28s. per cwt.
Clarke's compost £3 12s. 6d. per hhd., sufficient for three acres.
Fothergill's gypsum 35s. per ton.
Fothergill's phosphate of lime £8 10s. per ton.
Graves £6 10s. per ton.
Guano, Peruvian, £9 9s.; Bolivian £9 9s.; African £6 6s. to £7 10s. per ton, according to analysis and quantity.
Gypsum 30s. per ton.
Highly concentrated manure 30s. per qr.
Humus 14s. per qr.
Bone-dust 18s. 6d. per qr.
Half-inch bone 17s. 6d. per qr.
Hunt's stuff graves 3s. 6d. per cwt.
Hunt's new fertilizer 13s. 4d. per qr.
J. T. Hunt's artificial guano £9 per ton.
Manure powder 16s. per qr.
Muriate of lime 6s. per cwt.
Muriate of ammonia 25s. per cwt.
New-Bristol manure 8s. per qr.
Nitrate of soda £14 10s. to £15 per ton.
Nesbitt's Manures (prepared by the London Manure Co.) £8 to £14 per ton. according to crop.
Nitrate of potash (saltpetre) £26 to £28 pr ton.
Patent disinfected manure £9 per ton.
Petre salt £2 per ton.
Potter's guano £9 per ton.
Preparation for turnip-fly 10s. 6d. per pakt. sufficient for three acres.
Rags £4 to £4 10s. per ton.
Rape cake £6 per ton.
Rape dust £6 6s. per ton.
Soap ashes 10s. per ton.
Soda ash 12s per cwt.
Spence & Co.'s urated bone manure £8 pr ton.
Sulphate of soda 6s. per cwt.
Sulphur for destroying the worm on turnips 12s. per cwt.
Sulphuric acid 1¼d. per lb.
Superphosphate of lime 7s. 6d. per cwt.; £7 per ton.
The Liverpool Abattoir Company's animalized manuring powder £2 10s. per ton.
The urate of the London Manure Company £4 4s per ton.
Willey dust £4 4s. per ton.
Wolverhampton compost (Alexander's) 12s. per qr. subject to carriage to London, or forwarded from Wolverhampton.

RHUBARB, OR THE PIE-PLANT.

No vegetable, within our knowledge, unless it be the tomato, has more rapidly come into general use, nor does any possess higher merits to recommend it, than the Rhubarb, or Pie-plant, as it is called, from the great quantity of material it supplies very early in the season for pies of the most palatable and wholesome description. Another strong recommendation is, its capacity to withstand and grow in the coldest climate. From the 1st to the 12th of May, we found it every day, as far north as Boston, on the table d'hôte of the Tremont House—an establishment unexcelled in all the requisites of excellence—forming a part of the dessert both various and exquisite, and saw it growing in most of the gardens around the city. The increase in the consumption of it may be judged by the fact that a gentleman in Boston remarked that near London, he had known a gardener to extend the culture of Rhubarb, within his personal recollection, from one up to *seventy acres!*

In a late number of the Gardener's Chronicle, we find the following

Practical Hints for Amateurs and Small Gardeners.—*Rhubarb.*—This wholesome and agreeable vegetable has become so popular as a substitute for fruit in the early spring, that no garden should be without it. It will grow anywhere, is so hardy that no frosts will injure the roots, however much exposed, and is so prolific that a few plants will yield a plentiful supply of stalks for a large family. Yet, notwithstanding the ease with which it is cultivated, we often see it badly grown, and sometimes hear the complaint that parties have failed in their efforts to get a crop. Our remarks will obviate every objection, if attended to, and enable our readers to grow Rhubarb for themselves with ease and success.

Rhubarb has a hard underground stem, which pushes forth its buds plentifully at the crown, or part nearest the surface; every one of these buds taken off with a portion of root adhering to it, will form a large plant in one season. If you wish to make a plantation now (although the season is rather too far advanced, it may still be done), get as many buds or crowns as your bed will admit of, allowing each two or three feet every way, according to the habits of the varieties you prefer. The plan generally adopted is to purchase as many roots as are necessary to fill the allotted space; but this is a more expensive and far less eligible method than the one now recommended. Last year a new sort of Rhubarb was offered in the neighborhood of the writer at 5s. a plant. Some of his friends purchased four or five roots, but he was satisfied with one. On receiving it he placed it in a hole, and covered it up with soil until February, when, on examination, five good buds were developed. The root was then divided into five parts, each of which, at the present time, is a large flourishing plant, equal to any of those which were not divided. A bed was thus obtained for 5s., equal, indeed superior, to some costing 25s. We are convinced, from actual experiment, that Rhubarb may be brought to perfection in one year; that old beds are inferior to new ones; and that fresh plantations should be made every two years. The old plan of making a bed to descend to posterity should be exploded, in reference to many garden productions. Strawberries, raspberries, Rhubarb, &c., should be removed often, if fine healthy produce is wished for.

Having a sufficient number of buds or crowns, let them be planted in a well trenched and manured soil. If the leaves are developed, care must be taken to prevent their flagging. This may be done by placing over them some long litter, sufficient to answer the purpose without excluding light and air. The young plants will soon be established, and will grow rapidly. *No leaves must be taken off the first year*, as the object is to convey all the elaborated sap possible to the stem for future use. If the ground is good, and *kept free from weeds*, no more care is required, and abundance of fine stalks can be taken off next spring. An exposed situation, with plenty of sun and air, will of course bring this production to greatest perfection; but it will produce good crops without having these advantages fully. Every house with a garden, however small, may thus furnish the table of its owner, with little expense and trouble.

But Rhubarb possesses the advantage of being forced with as much ease and as cheaply as it is grown in the open air. This may be done by growing it against a wall in a sunny aspect, and covering it when required with pots or boxes, over which fermenting materials must be placed. But decidedly the best method is to take the roots into the house to

be forced. For this purpose they must be grown exactly as recommended above, that as much power may be treasured up in the roots as possible. To take up exhausted plants from a crowded bed, which has been stripped of its leaves during the season, is to deprive them of their natural advantages, and to expend the forcing process on weakened and imperfect subjects. Let cuttings, with a crown to each, be now put in, in the best possible situations, and by autumn they will be admirably adapted to your purpose. When the foliage is withered, take up the roots, and put them singly into large pots or boxes. These may be stood away anywhere, and introduced, two or three at a time, into a warm situation. The writer placed his pots this winter in a dark closet, at the back of a kitchen range, and the Rhubarb grew rapidly. Every house can find some spot having the advantage of greater warmth than the ordinary temperature. Rhubarb may thus be had at any time, and a good supply kept up until it is produced in the open air. It is very necessary to get it as early as possible, as its value is much lessened when gooseberries are plentiful.—H. B.

NEWCASTLE FARMERS' CLUB.

THE CULTIVATION OF TURNIPS.

Mr. Ramsay introduced the subject: The kinds of turnips most commonly cultivated are the Swedish, the hybrid (said to be raised between the yellow bullock and Swede), the yellow bullock, the Aberdeen yellow, the white globe, the green globe, and occasionally a few other sorts, with various names. The Swedish bears the frost well, and will keep till June. It does not yield so weighty a crop as the globe, or some other kinds: nevertheless its feeding qualities more than compensate for the loss of weight per acre, and it is generally consumed by the highest priced stock on the farm: such as animals feeding fat, and milch cows, and those generally kept for use till spring months, it, like the carrot, feeding best when partly withered in appearance. Too great exertions cannot be made to have a sufficiency of the Swedish turnip, as it is valuable spring food for every animal on the farm. It is rather more expensive to raise than some other kinds, requiring more manure, but its quality more than compensates for the difference in cost of producing. A good crop of Swedes will weigh twenty tons per acre, if raised upon useful land, and the price in Newcastle at this time is 25s. to 26s. per ton. The hybrid, the yellow bullock, and Aberdeen yellow come next in order as to their feeding qualities, as well as keeping in the spring.—They are all useful turnips and approach nearest the Swedish. They can be grown upon lighter soil than the Swedes, and are consequently often substituted for them. They can be sown later, which is an advantage in some seasons, particularly when many potatoes are grown, the latter requiring much spring labor. The globes are most valuable for producing a great weight per acre. All kinds of cattle and sheep are fed upon them, from the beginning of November until after Christmas, and in many instances in the spring months; but they do not keep so well as the Swedish and yellow turnips, consequently are generally fed off first. Enormous weights per acre are said to be produced —even as far as 60 tons per acre. I have had 50 tons myself, which I was well satisfied with. I will not say 63 tons have not been grown, as I know occasionally larger crops of all kinds are produced: however, I should think 30 or 40 tons per acre easily attainable. All descriptions of soil are now made to grow turnips; and they have become so necessary to the raising of dung, and rearing and feeding of cattle and sheep, that one now scarcely knows how to carry on his agricultural operations without them. All stock are kept healthy when judiciously fed with them, and when eaten on dry land by sheep they increase the following crops to a great degree. The turnip crop takes the place of a summer fallow, generally speaking. The land is plowed before winter, and again early in the spring, either across the first plowing or otherwise. In the months of April, May, or June, the land, with frequent stirrings with the plows, harrows, and scarifier, is made as fine and clean as possible. I find the latter implement very useful in assisting to prepare the land well, and recommend a more extended use of it; it is expeditious, and drags the quickens and other weeds to the top, where the sun and air act powerfully upon them; it does not cut the quickens so much as the plow, therefore more effectually destroys them. I think the land cannot well be reduced too fine for producing turnips The seed being very small requires a well pulverized bed, which not only causes the seed to germinate quickly, but accelerates the growth of the plant when young; consequently assists it in escaping the fly, one of the greatest enemies of the young plant. When I advise frequent plowings, &c, I would wish to guard against this being done too rapidly—having seen great losses occasioned by working all the moisture out of the ground before the seed is sown. There ought to be intervals between the plowings; and if the weather is dry the land should be well rolled down, and remain so for some time, to regain the moisture which has been drawn off by the continued exposure of the land to the sun and air. The distance of the drills for Swedes, as well as most other sorts, varies from 26 to 30 inches in width. After this is done the carts next deposit 10 to 20 tons of dung per acre, according to its quality, as well as the quantity which may have been made on the farm. It is then equally spread and covered in by the plow, and then is ready for the seed. If the season is tolerably fine, and the dung properly prepared, there will seldom be a failing crop. If these matters are duly attended to, I believe there will not be very many failures, making allowances for weather, over which we have

no control. I am pretty sure many of you have seen a great difference in a field sown on different days: nay, even between a few hours' sowing. This shows the necessity of watching closely the state of the ground at the time of sowing. There is often too much haste in getting the seed in, without considering whether or not the land is fit to receive it. Small neglects make, at times, great differences in the weight of crop. Having noticed the raising of turnips with fold-yard manure alone, I beg to recommend the general crop to be grown with part fold-yard and part special manure, of some kind or other. Since the introduction of special manures, too numerous for me to mention, the quantity of turnip-growing has been increased immensely. I cannot do better than recommend the members of the Club to read Rev. A. Huxtable's account of raising Swedish turnips upon land. He will tell you how, by the application of his chemical knowledge, he raised large crops from land as bad as land could possibly be, and which had never grown turnips before. (See sixth volume of the "Royal Agricultural Society's Transactions.") Certain it is that the extensive application of bone-manure has increased the quantity of acres under turnips to an amazing extent, and proved to be a most useful manure on all light lands. It not only has been found to produce large crops of turnips, but has also been found by experience to be a lasting manure. I have one field which has been entirely manured with bone-manure for sixteen years, and is much improved since the commencement, having been boned every fourth year. Next, as to seed. The very best ought to be purchased. Three pounds per acre is often recommended; I have found two pounds per acre quite sufficient, when the land is properly prepared. I would recommend land, intended for turnips, to be clean; for if land grows quickens, rest assured it cannot grow turnips. Also to have the soil well pulverized previous to sowing—to allow the drills to be ridged up a day or two before the drill is set to work—to be sure to have the manure well prepared and evenly spread—to use bone-dust, guano and other special manures along with fold-yard dungs, in preference to using any of them alone—to deposit the seed with a light covering of earth—to use good seed, and thin the plants ten to twelve inches, particularly Swedes, which require to be from twelve to fourteen inches asunder—to scuffle as deep as practicable, for the purpose of admitting air and water to the plants—to sow the Swedes about the middle of May—yellow bullocks and other yellow sorts as soon after as convenient, following on with globes till the middle of June, or even in some cases rather later, according to seasons—and not to attempt to sow more land than can be well be prepared and manured.

Mr. Joseph Laycock said the grand desideratum in Agriculture was the attainment of those particular ingredients which the plant required for its sustenance. To apply at random a number of ingredients, in the hope that if many were inoperative, others would nourish the plant, was extravagant and wasteful farming. Now what was it that the turnip most required? Chemistry answered the question. It was phosphate (or superphosphate) of lime that was chiefly needed; and the turnip-grower should inform himself how he could obtain the most of this manure at the least expense. He had heard this question discussed, and with much ability, at one of the meetings of the Royal Agricultural Society in London. Mr. Pusey, one of the speakers, pointed out what he considered the most inexpensive mode of procuring the phosphate; and he had adopted that gentleman's suggestion with great success; for when he, a few years ago, began farming, his predecessor in the occupation of the land assured him that it would not grow turnips, and yet he had succeeded, by following the plans of Mr Pusy and other enlightened agricultural authorities, in raising excellent crops. The phosphate of lime existed in bones, but in combination with matter which prevented its direct application to the land with good effect. The method which Mr. Pusey adopted, and by which he got rid of the difficulties which stood in the way of ordinary farmers in the use of phosphate of lime, was the following: He made a mound of soil, or, better still, of burnt ashes, and fashioned the summit into the form of a crater. Into this large basin he put a few half-inch bones, and then poured in some sulphuric acid (oil of vitriol); and so he went on, alternately putting in bones and acid. The proportions were 4 bushels of bones to 80 lbs. of acid. The cost of the acid was 8s. 4d., and of the bones 10s.; and this made a sufficient quantity for an acre. The mixture of the bones and acid evolved great heat, and he added 5 gallons of water—hot water. He had found it convenient, however, to mix for 2 acres in one heap of mould; because, in that case, one whole carboy of acid (160 lbs.) was required: and, of course, the quantity of bones and hot water must also be doubled. The mixture was stirred up with a hay-fork, and covered over with ashes for a day or two. It would then be found in the form of a powder, and should be turned over twice or thrice. He applied it with a seed-drill, mixed with fine powdered soil or ashes, at the rate of 4 bushels of the phosphate to an acre. It caused an early growth, and carried the plant quickly through that first stage in which it was most liable to flies, &c. For the growth of Swedes he had applied this dust with farm-yard manure, and would advise every farmer to do the same. It brought them 8 or 10 days earlier to the hoe; and every one knew what an advantage this must be. It might be asked, why make this phosphate, when it might be had of agricultural chemists ready-made? But, if the farmer made it himself, he knew what he was using. Turnips, with this manure, might not have so much top as with guano, but they would bulb well and keep well.

STARCH FROM DISEASED POTATOES.—Starch made from diseased potatoes, it is said, has been found to injure silk goods when used to stiffen them. The goods are covered with spots, which, when examined through a microscope, present the same fungus that is found in the diseased potato.

AN ADMIRABLE CURE FOR THE TOOTHACHE.—A small piece of Radix pyrerethæ (Spanish root) placed upon the gum, or a piece of cotton steeped in an extract of the same root and similarly applied, completely removes this very annoying complaint.

FORMATION OF HUMUS,

OR WHAT IS CALLED VEGETABLE MOULD.

JOHN S. SKINNER, Esq. WINCHESTER, Va., May 14, 1848.

Dear Sir: I send you the facts which convinced me that "vegetable mould," "virgin earth," or "humus," as it is termed, is a change in the chemical qualities of the earth, caused by shade—having no necessary connection whatever with vegetable decomposition. First, a piece of meadow land which had been completelyexhausted by injudicious cultivation, was made quite as rich as river bottom, by permitting pure spring water to flow over it for a few years. Secondly, the spot from which an old building of any description has been removed is exceedingly fertile, and remains so for many years, although it may be cultivated in crops known to be the greatest exhausters of the soil. Thirdly, under plank, stone, logs, or any other substance which effectually shades the earth, we find the "vegetable mould" begins to form very soon, and progresses deeper and deeper precisely in proportion to the length of time the ground remains shaded. Fourthly, a field which is thickly covered with loose stone will produce fine crops of wheat or corn every year, although no manures or vegetable matter be returned to it. Fifthly, a single oak or other forest-tree will impoverish the land all around it; yet in our forests the trees grow luxuriantly, and leave the soil fertile beneath. This cannot be explained by the decomposition of the leaves, for it is well known that they are the most indifferent of all vegetable substances to convert into manure, and the least valuable when so converted; and "decayed vegetable fibre," or rather wood, is known to be destructive to vegetation of every description; besides, experience teaches us that we can make the trees grow and the soil fertile beneath by paving around the roots with stone, or any other indestructible substance. Sixthly, large masses of vegetable matters, when suffered to remain until completely decomposed, leave but a small residue, and we find large quantities of "vegetable mould," in caves and subterranean caverns, where vegetation cannot possibly exist.

If you think the interest of Agriculture will be promoted by publishing my communications, you will please do so; if not, you will do me the favor to *return them through the mail.*

Yours, very respectfully,
ROBERT BALDWIN.

NOTE ON THE ABOVE.

We might have suppressed the last words of the above, but that we choose to make them the subject of self-reproach and regret. Some time since we received and read with lively interest a paper from the same pen, on the *Action of Clover* as a fertilizer, ascribing its beneficial effects to its action in *shading the land*—but unfortunately, under peculiar circumstances producing some confusion and apparent neglect, we have *mislaid*, for the time being, that paper, and one of great interest from Mr. Devereux, of North Carolina, on the Culture and Value of *Pease* as a Fertilizer of Land, doing, in the South, the office performed by Clover in the North, with the addition of being of great value as food for hogs.

We still hope to recover these papers. Can we say as much in regard to our being excused by their authors?

We believe in the theory advanced by Dr. Baldwin, who is esteemed among the most zealous, observant, and scientific farmers of Virginia. Our recollection, very nearly as far back as it reaches, brings this corroboration of his remarks: The father of the Editor, FREDERICK SKINNER, of Calvert County, Maryland, is well remembered by the old people of the County as the introducer of almost everything new in the development of agricultural products, machinery and manures. From him—his conversations, course of reading and inquiries—we imbibed our insatiable passion for the pursuit, and we recollect noticing, when

yet a small boy, that he had always had the poorest spots on adjoining high land chosen for curing and stacking his low-land meadow hay; and when that hay was removed—say the next spring or summer—these *poor spots* were always among the most fertile on the farm. It is to its action in *shading* the soil that Doctor Baldwin, as we have said, contends is to be attributed its fertilizing influence. Let any poor spot or galded knoll be covered with bushes of any kind, and see how rank the grass will grow up among them, and how soon the land is restored. The subject is worthy of particular attention. Let our Societies or Institutes cause poor soil which has been thus covered, merely, without any application of manure, to be *analyzed*, and see what are the properties so soon acquired by protection, perhaps from *cold* as well as from the rays of the sun. For what more useful purposes are such institutions organized and supported by the public?

SOUTHERN RAILROADS.

We subjoin a statement of the principal railroads in the Southern States, together with the cost of travel on each. Several works are in progress which will materially extend the lines. When these are accomplished, we shall endeavor to exhibit the cost and dividends, as well as other specific information concerning all:

Companies.	Miles.	Fare.
IN ALABAMA.		
Montgomery and West Point	60	$3 00
IN GEORGIA.		
Western and Atlantic (State)	100	5 00
Georgia	171	7 00
Central	191	7 00
Macon Western	101	4 00
Total length	563	
IN SOUTH CAROLINA.		
South Carolina	136	6 75
Columbia	68	3 38
Total length	204	
IN NORTH CAROLINA.		
Wilmington and Weldon	161	$5 00
Gaston and Raleigh	87	4 00
Total length	248	
IN VIRGINIA.		
Petersburg and Roanoke	63	3 00
Richmond and Petersburg	22	1 00
Richmond, Fredericksburg and Potomac	133	5 50
Winchester and Potomac	32	2 00
Louisa	50	4 00
Total length	300	

There is no reason why the stock of Southern railways should not be profitable. As a specimen, we take the Report of the President of the Petersburg Railroad Company, for the year ending 30th September last:

Total receipts for passengers and freight	$179,867 94
Expenses of every kind, repairs, &c	73,637 13
Income after payment of expenses	$106,230 81

The cost of the road was $801,611 52; the dividend, therefore, is a fraction over thirteen per cent.

In his late Report, the President of the South Carolina Railroad Company sums up the operations of the year:

Gross receipts from 1st January to 30th December, 1847	$655,575 30
Current expenses in same period	303,480 40
Net revenue	$352,094 90

[De Bow's Commercial Review.

Rose Bugs and Potato Bugs.—Take fresh, dry, burnt wood-ashes and sprinkle over the potato-tops or rose-bushes (or other shrubs and vines) as soon as the bugs appear pretty numerous, and they will soon leave. We have tried this effectually, and it may be relied on. Before we discovered the remedy, which was made known to us by our hired man,) we took from one to two handsfull of rose bugs from a single bush—according to size.

[Prairie Farmer.

LETTER XVII.

SHEEP-DOGS, WOOL DEPOTS, &c.

The estimation in which dogs have been held by different nations, &c...The Sheep-Dog—Buffon's description of him...The Spanish Sheep-Dog—Origin—Introduction into the United States—Value—Arrogante—his history...The Hungarian Sheep-Dog—Mr. Paget's description of—probable origin—The Mexican Sheep-Dog—Mr. Lyman's description of—Mr. Kendall's...South American Sheep-Dogs—Darwin's description of...The English Sheep-Dog—Mr. Gates's description of...Mr. Colman's...The Scotch Sheep-Dog—Mr. Hogg's account of..Mr. Peters's...Necessity of accustoming Sheep to a dog...Wool Depots—Mr. Blanchard's account of their origin—Letter from Mr. Peters, describing their object, methods of doing business, and advantages—Utility of these depots—their especial utility to the South...A correction—Mr. Ruffin...Note in relation to Australia—Statistics of its Wool Trade brought down to 1846.

Dear Sir :—In all ages of the world, and among nearly all nations, savage and civilized,* the dog has been the friend and cherished companion of man. The Egyptians placed him among their gods. The Greeks held him in the highest estimation. His figure mingles with that of warriors and demi-gods on their friezes; and Argus, the dog of Ulysses, lives as immortal in the Odyssey, (*vide Book XVII., p.* 344 *to* 400) as his sagacious master, or the faithful Penelope. Alexander the Great founded a city in honor of a dog! The Romans treated him with similar respect. His skin covered the statues of the sacred Lares; his figure, as the emblem of care and vigilance, stood at the feet of these household gods—venerated and loved as the tutelary manes of departed ancestors. Horace in his Ode to Cassius Severus (*Book V., Ode VI.,*) compares himself to the Molossian, or the tawny Spartan dog, which defends the flocks, and with ears erect, pursues the wild beast through the deep snows. Virgil, in the delightful Georgics, admonishes the Roman shepherds not to neglect the care of their dogs :

"Nec tibi cura canum fuerit postrema : sed unà
Veloces Spartæ catulos, acremque Molossum,
Pasce sero pingui : nunquam, custodibus illis,
Nocturnum stabulis furem, incursusque luporum,
Aut impacatos à tergo horrebis Iberos."

[*Georg. Liber III., commencing at line* 404.

Thus translated by Sotheby :

Nor slight thy dogs ; on whey the mastiffs feed,
Molossian race, and hounds of Spartan breed;
Beneath their care, nor wolves, nor thieves by night,
Nor wild Iberian shall thy fear excite.

These "Spartan hounds," I may remark, par parenthesis, are the ones spoken of by Shakspeare, in that glorious description of the music of a pack in full cry, and of the points of a hound, in *Midsummer-Night's Dream :*

Hippolita.—I was with Hercules, and Cadmus, once,
When in a wood of Crete they bayed the bear
With hounds of Sparta : never did I hear
Such gallant chiding ; for, besides the groves,
The skies, the fountains, every region near
Seemed all one mutual cry : I never heard
So musical a discord, such sweet thunder.

Theseus.—My hounds are bred out of the Spartan kind,
So flewed, so sanded; and their heads are hung
With ears that sweep away the morning dew ;
Crook-kneed, and dew-lapped, like Thessalian bulls;
Slow in pursuit, but matched in mouth like bells,
Each under each. A cry more tunable
Was never hallo'd to, nor cheered with horn,
In Crete, in Sparta, nor in Thessaly.

* The only exceptions which now occur to me are the Jews, the Hindoos, and the Mahommedan nations and tribes.

Arrian, Pliny, Oppian, Ælian, and a host of other writers of the Empire, descant on the praises of the dog, or give anecdotes of his courage, strength, and fidelity.

In the chivalric ages, he was the companion of knights and princes—the soul of the manly field-sports of those times. Even prelates followed him to the chase. The abbots of St. Hubert *bred* a celebrated race of hounds. St. Hubert himself, St. Eustace, and many others on the canonized calendar, were keen hunters. "*Whereupon*," says the author of the "Noble Art of Venerie," &c., published in 1611, "*we may conceive that (by the grace of God) all good huntsmen shall follow them into Paradise!*" Truly, a consoling religious *sequitur!*

Scott, in his beautifully descriptive poetry, and still more poetical prose, has given us a whole picture gallery of dogs, from the Middle Ages down. The few which start up first in memory, (in *my* memory,) because, probably, linked with the most interesting associations, are Fangs—a genuine Saxon—gaunt and unkempt, but stanch as his master, Gurth, the son of Beowulph; the noble hound of Sir Kenneth; the "two dogs of black Saint Hubert's breed," that with Fitz-James pursued their quarry into the wild pass of the Trosachs; the faithful little terrier, which,

> ——"on the dark brow of the mighty Hellvellyn,
> The much-loved remains of her master defended,
> And chased the hill fox and the raven away;"

and last, not least, Hector McIntyre's bitch Juno, which stole the butter, and broke the "lachramatory from Clochmaben," of the glorious old Antiquary. They stand out on the canvas like Landseer's pictures. We pause to hear them *bark!* It has often occurred to me that Scott omitted a fine opportunity, indeed, made a *hiatus vale deflendus*, in not introducing one or more of the Alpine spaniels—or dogs of Mount St. Bernard—into his Anne of Geierstein, providing it could be done, (on which point I am uninstructed,) without a violent anachronism. When Arthur clung dizzy and stupefied to the trunk of the tree which hung over the beetling verge of the precipice—when the cry of the Swiss maiden announced approaching succor, should it not have had for its accompaniment the baying of one of those great dogs of the Alps—the deep and far-heard reverberations of which so often calls help to the perishing traveler, for miles, through the howling storm? Should not the dog of Donnerhugel, on the night-watch of Graffs-lust, have been of the same breed—huge, shaggy, and daring as himself? The portrait of Barry, a Bernardine dog which saved the lives of forty persons, and finally perished in an avalanche in guiding some travelers to St. Pierre, is to be found in every print-shop. It represents him carrying a child on his shoulders—clinging by his shaggy hair,—which he found in the Glacier of Balsore, and rescued from approaching death.

Scott is not the only modern poet who has admired and sung the praises of the dog. And I do not recollect the instance of one, who has mentioned him, that is, the *well-bred* dog, who has not praised him, except Byron in these moody lines:

> "Perchance my dog will whine in vain,
> Till fed by stranger hands;
> But long ere I come back again
> Would tear me where he stands."

In his epitaph on his Newfoundland dog, the noble poet retracted this ungenerous libel, and pays one of the warmest tributes to the fidelity of the dog, on record.

Volumes of anecdotes of canine sagacity might be easily compiled.

Reasoning powers the dog undoubtedly possesses, quite on a par with ordinary humanity, if we may believe scores of these writers. But it is probable that the grandsires of some of them "drew good *long-bows* at Hastings," and they, like Hubert, may lay claim to a hereditary knowledge of the weapon. It is to be feared that dog-stories will soon be sunk to a par with *fish-stories!* The truth is, the dog knows enough, and there are authenticated cases enough of his wonderful sagacity, without having an air of discredit thrown over the whole of them, by fanciful exaggerations.

The comparative intelligence, and the comparative value to man, of the different species of the dog, would be very differently estimated by those who have been placed in situations to be particularly benefited by the peculiar instincts of this race or that. Nearly every species has some traits, some uses, where it is unequaled by the others; and each in its place is valuable. I do not, however, mean these remarks, or any others which I have made in favor of the dog, to apply to the mongrel tribe of curs. That there have been valuable individuals from this disreputable stock, all must admit; but the miserable, cowardly and thievish character of the mass of them has been proverbial in all time. Far too many of them are kept by our farmers in the place of noble and serviceable animals and multitudes of them, owned by idlers and vagabonds, infest the country and do ten times more mischief to our flocks than diseases and beasts of prey.

The Sheep-Dog.—Buffon thus eloquently describes the sheep-dog,* and compares his sagacity and value to man, with other races†:

"This animal, faithful to Man, will always preserve a portion of his empire and a degree of superiority over other beings. He reigns at the head of his flock, and makes himself better understood than the voice of the shepherd. Safety, order, and discipline are the fruits of his vigilance and animal. They are a people submitted to his management, whom he conducts and protects, and against whom he never applies force but for the preservation of good order. . . . If we consider that this animal, notwithstanding his ugliness, and his wild and melancholy look, is superior in instinct to all others; that he has a decided character in which education has comparatively little share; that he is the only animal born perfectly trained for the service of others; that, guided by natural powers alone, he applies himself to the care of our flocks, a duty which he executes with singular assiduity, vigilance, and fidelity; that he conducts them with an admirable intelligence, which is a part and portion of himself; that his sagacity astonishes at the same time that it gives repose to his master, while it requires great time and trouble to instruct other dogs for the purposes to which they are destined; if we reflect on these facts, we shall be confirmed in the opinion that the shepherd's dog is the true dog of Nature, the stock and model of the whole species."

I shall call attention to but a few of the most distinguished varieties of the sheep-dog.

The Spanish Sheep-Dog.—Of the origin of this celebrated race, I do not recollect to have seen anything. I have observed them several times spoken of, latterly, in newspapers and agricultural publications, as the same variety with the Alpine Spaniel, or Bernardine dog. This, I think, must be an error, though there may be a general resemblance between the two species. Arrogante, on the next page, though a dog of prodigious power, decidedly lacks the massive proportions, both in body and limbs, of several Bernardine dogs, which I have seen, of unquestiona-

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* I stated near the close of Letter V. that there are no shepherd dogs large and powerful enough to encounter and kill wolves and vagrant dogs, except the great Sheep-dog of Spain, and that he is so ferocious that he might frequently bring his owner into difficulty, and even endanger human life.—I was mistaken. Crosses between this and other species seems to have mitigated the ferocity of the Spanish dog, and still left it within the power of two to overcome a wolf, as will appear from what follows.

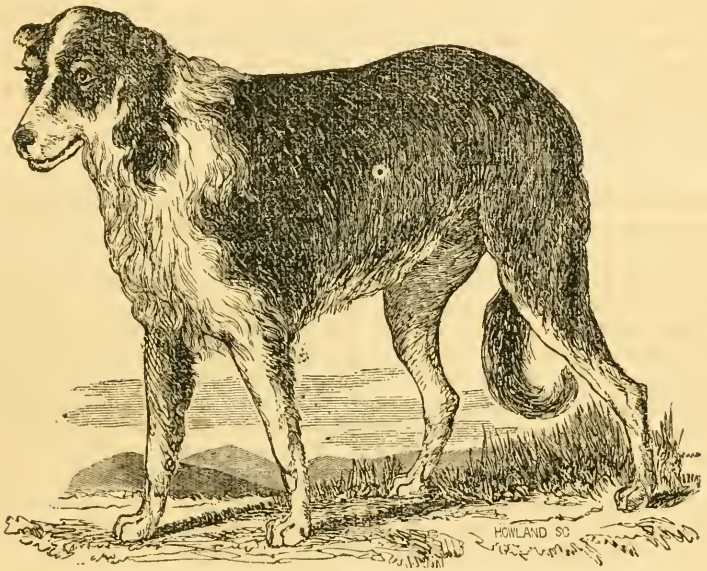
† Buffon's Natural History, vol. v., pp. 306, 318.

ble lineage. The *temper* and disposition of the two species, too, seems to me to be essentially different.

Mr. Trimmer, and various other foreign writers, speak in warm terms of the value of the Spanish sheep-dog, for guarding the migratory flocks of that country from the attacks of wolves—staying behind to protect feeble and lagging sheep, &c. In the Memoirs of the Pennsylvania Agricultural Society, there is a communication from the well-known John Hare Powell, Esq., of Philadelphia, from which the following are extracts :—

"The first importations of Merino sheep were accompanied by some of the large and powerful dogs of Spain, possessing all the valuable characteristics of the English shepherd's dog, with sagacity, fidelity and strength peculiar to themselves. . . . . Their ferocity, when aroused by any intruder, their attachment to their own flock, and devotion to their master, would, in the uncultivated parts of America, make them an acquisition of infinite value, by affording a defence against wolves, which they readily kill, and vagrant cur dogs, by which our flocks are often destroyed. The force of their instinctive attachment to sheep, and their resolution in attacking every dog which passes near to their charge, have been forcibly evinced upon my farm."

Fig. 71.



ARROGANTE—A SPANISH SHEEP-DOG.

Arrogante, whose portrait is above given with admirable fidelity, was imported from Spain with a flock of Merinos, a number of years since, by a gentleman residing near Bristol, England. His subsequent owner, Francis Rotch, Esq., of this State, thus describes him in a letter to me, which, though not intended for publication, I will venture to make a few extracts from :

"I have, as you desired, made you a sketch of the Spanish sheep-dog Arrogante, and a villainous looking rascal he is. A worse countenance I hardly ever saw on a dog! His small blood-shot eyes, set close together, give him that sinister, wolfish look, which is most unattractive; but his countenance is indicative of his character. There was nothing affectionate or joyous about him. He never forgave an injury or an insult: offend him, and it was for life. I have often been struck with his resemblance to his nation. He was proud and reserved in the extreme, but not quarrelsome. Every little cur would fly out at him, as at some strange animal; and I have seen them fasten for a moment on his heavy, bushy tail, and yet he would stride on, never breaking his long, 'loping,' shambling trot. Once I saw him

turn, and the retribution was awful! It was upon a large, powerful mastiff we kept as a night-guard in the Bank. He then put forth his strength, which proved tremendous! His coat hung about him in thick, loose, matted folds, dirty and uncared-for,—so that I presume a dog never got hold of anything about him deeper than his thick, tough skin, which was twice too large to fit him anywhere, and especially around the neck and shoulders. The only other evidence of his uncommon strength which I had observed, was the perfect ease with which he threw himself over a high wall or paling, which often drew my attention, because he seemed to me wanting in that particular physical development which we are accustomed to consider as necessary to muscular power. He was flat-chested, and flat-sided, with a somewhat long back and narrow loin. (My drawing foreshortens his length.) His neck, forearm and thigh certainly indicated strength. If the Spanish wolf and the dog ever cohabit, he most assuredly had in him such a cross; the very effluvia of the animal betrayed it. In all in which he differed from the beautiful Spanish shepherd-dog, he was wolfish both in form and habits.* But, though no parlor beauty, Arrogante was unquestionably a dog of immense value to the mountain-shepherd. Several times, he had met the large wolf of the Appenines, and without aid slain his antagonist. The shepherds who bred him said it was an affair of no doubtful issue, when he encountered a wolf single-handed. His history, after reaching England, you know."

Some portions of that history I cannot resist the temptation of narrating, as illustrative of the character of this interesting breed, and commemorative of the virtues of the stern, but honest and dauntless Arrogante. If his courage was tinctured with ferocity, and sometimes instigated by a revenge, going a little beyond the canon which permits bad debts to be paid in kind, he did everything *openly!* He made no sneakish, cur-like attacks, on the heels of his foe. By him, as by Robin Hood and his merry men—commemorated by Drayton—

"Who struck below the knee [was] not counted then a man;"

and his spring was always at the *throat* of his quarry. But he made not that deadly spring until he gave "warning fair and true," and never without provocation.†

Soon after Arrogante's arrival in England, a ewe under his charge chanced to get cast in a ditch, during the temporary absence of the Spanish shepherd who had accompanied the flock and dog at their importation. An English shepherd, in a spirit of vaunting, insisted on relieving the fallen sheep, in preference to having the absent shepherd called, though warned by his companions to desist. The stern stranger dog met him at the gate and also warned him with sullen growls, growing more menacing as he approached the sheep. The shepherd was a powerful and bold man, and felt that it was too late now to retract with credit. On reaching the sheep, he bent carefully forward, with his eyes on the dog, which instantly made a spring at his throat. A quick forward movement of his arm saved his throat, but the arm was so dreadfully lacerated that immediate amputation became necessary. To save the dog, which had but done his duty, *as he had been taught it*, from the popular excitement, he was shipped in a vessel which sailed that very afternoon, from Bristol for America. He was sent to Francis Rotch, Esq., then a resident of New-Bedford.

For a long time Arrogante would not pay the least attention to his new master; the voice of the latter would scarcely arrest him for a moment. After attempting in vain, for several weeks, to obtain some recognition of mastership from him, Mr. Rotch chained him securely to a tree, punished him severely, and then, with not a few misgivings, released him. But he submitted, for he well knew that the punishment came from his master, and afterward gave a cold, haughty obedience to all required of him.

* I never have supposed, from the several conversations which I have had with Mr. Rotch on the subject, that Arrogante was anything less than a thorough-bred Spanish shepherd-dog. Mr. Rotch here means that he was an ill-favored individual of the family—and he thinks that this *may* be owing to a bar-sinister on his escutcheon, left there by some wolfish gallant. His temper was even *less ferocious* than Mr. Powell describes that of *his* Spanish dogs.

† Was there anything *wolf-like* in all of this?

Stupid and apparently sleeping much of the day, nothing, however, escaped his observation, or was subsequently erased from his memory. If led round a building, or enclosure, or even an open space, at night-fall, in a manner to evince particular design, during the entire night like a sentinel he traversed some part of the guarded ring, permitting neither man nor beast to pass *in* or *out* from it.

Arrogante was a "temperance man," of the straightest sect—an out-and-out *teetotaler*—and if tolerant of deviations from his *creed*, he could bear none, from the sobriety of his *practice*. Never would he confess acquaintance with a drunken man—though the hand of that man fed him. The bailiff, who usually fed Arrogante, used occasionally to come home late in the evening a little "*fou*," and never could he in this condition get his foot on the premises! The old man has plead guilty to more than one night's lodgings on the ground, in consequence of Arrogante's temperance scruples.

On one occasion a couple of sailors, to take advantage of the tide, came unexpectedly, and without giving any notice, on the farm, at 3 A. M., to take away some potatoes they had purchased. Arrogante thought it was not so "nominated in the bond;" he forced them to clamber into an empty cart, and there he kept them until morning. They tried the experiment of putting a leg over the side once or twice, but were admonished in too unequivocal a manner to keep quiet, to need any farther hints. They lost the tide, and were in great tribulation, but, like honest fellows, confessed the fault was their own.

I might, did limits allow, recount many more anecdotes displaying the iron determination and fixed precision with which this noble dog obeyed his instructions in guarding sheep or other property committed to his charge. He was a decided "strict constructionist," swerving not from the letter of his commission, and woe to him who attempted to countervail the tenor of that commission!

Drunkenness was destined to prove as fatal as it was detestable, to Arrogante. A gentleman occupied a cottage orné by the sea-side, the lane to which ran along the farm, and near the stable which Arrogante made his head-quarters, when not on particular duty. The gentleman was regularly *introduced* to him, and warned against ever provoking him. Returning him home late one Saturday evening on horseback, from a *convivial* meeting, as he galloped through the lane, he met the dog, and wantonly struck him or struck at him with a hunting-whip. He was a large man, and rode a tall, powerful horse, and being under speed, he escaped before the astonished dog recovered from his surprise. But the insulted blood of Castile rushed in boiling currents through the veins of the maddened Arrogante. He felt, like his countryman De Lerma, in Epes Sargent's tragedy of Velasco—

> "Struck like a menial! buffeted! degraded!
> Spare not my life, if mercy thou would show,
> Thou givest me back only what thou hast made
> A burden, a disgrace, a misery!"

But Arrogante felt both the power and will to avenge himself, and he resolved on a bloody retribution.

The next morning the gentleman was on his way to church, mounted as before. The dog heard and knew the tread of his horse, rose from his lair in the stable, walked to the road-side, and stood grimly awaiting his insulter. When the latter had approached within a few yards, Arrogante, like a missile projected from a catapult, met him *in the air*, in a deadly spring at his throat. The sudden jump and swerve of the frightened and

very active horse, saved the rider's throat and his life—but so narrowly had he escaped, that he felt the gnashing teeth of the frenzied brute *scrape down* his dress, where they came in contact with and closed upon his watch, tearing it away with the adjacent clothing. The horseman fled for his life, while the baffled dog vented his rage on the gold watch which he had captured, by chewing it *into atoms!* The cause of this terrible onset not being disclosed at the time, Mr. R., though convinced from the character of the dog that he had not been the aggressor, felt constrained to give orders to have him shot.

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THE HUNGARIAN SHEEP-DOG.—The following description of the Hungarian Sheep-Dog, occurs in Paget's "Hungary and Transylvania:"*

"It would be unjust to quit the subject of the Puszta Shepherd without making due and honorable mention of his constant companion and friend, the juhász-hutya—the Hungarian shepherd dog. The shepherd dog is commonly white, sometimes inclined to a reddish brown, and about the size of our Newfoundland dog. His sharp nose, short erect ears, shaggy coat, and bushy tail give him much the appearance of a wolf; indeed, so great is the resemblance, that I have known a Hungarian gentleman mistake a wolf for one of his own dogs. Except to their masters, they are so savage that it is unsafe for a stranger to enter the court-yard of a Hungarian cottage, without arms. I speak from experience; for as I was walking through the yard of a post-house, where some of these dogs were lying about, apparently asleep, one of them crept after me, and inflicted a severe wound on my leg, of which I still bear the marks. Before I could turn round, the dog was already far off; for, like the wolf, they bite by snapping, but never hang to the object like the bull-dog or mastiff. Their sagacity in driving and guarding the sheep and cattle, and their courage in protecting them from wolves and robbers, are highly praised; and the shepherd is so well aware of the value of a good one, that it is difficult to induce him to part with it."

I have little doubt that the Hungarian dogs above described are the descendants of the Spanish ones, introduced into Hungary with the Merino sheep, though possibly they may be somewhat crossed by interbreeding with the dogs of the country.

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THE MEXICAN SHEEP-DOG.—The following acccount of these noble dogs appears as a communication from Mr. J. H. Lyman, in the third volume of the American Agriculturist:†

"Although Mr. Kendall and some other writers have described this wonderful animal as a cross of the Newfoundland dog, such, I think, cannot be the fact; on the contrary, I have no doubt he is a genuine descendant of the Alpine mastiff, or more properly, Spanish shepherd dog introduced by them at the time of the Conquest. He is only to be found in the sheep-raising districts of New Mexico. The other Mexican dogs, which number more than a thousand to one of these noble animals, are the results of a cross of everything under the sun having any affinity to the canine race, and even of a still nobler class of animals if Mexican stories are to be credited. It is believed in Mexico, that the countless mongrels of that country owe their origin to the assistance of the various kinds of wolves, mountain cats, lynxes, and to almost if not every class of four-footed carnivorous animals. Be this as it may, those who have not seen them can believe as much as they like; but eye-witnesses can assert, that there never was a country *blessed* with a greater and more abundant variety of miserable, snarling, cowardly packs, than the mongrel dogs of Mexico. That country of a surety would be the plague-spot of this beautiful world, were it not for the redeeming character of the truly noble shepherd dog, endowed as it is with almost human intellect. I have often thought, when observing the sagacity of this animal, that if very many of the human race possessed one half of the power of inductive reasoning which *seems* to be the gift of this animal, that it would be far better for themselves and for their fellow-creatures.

The peculiar education of these dogs is one of the most important and interesting steps pursued by the shepherd. His method is to select from a multitude of pups a few of the healthiest and finest-looking, and to put them to a sucking ewe, first depriving her of her own lamb. By force, as well as from a natural desire she has to be relieved of the contents of her udder, she soon learns to look upon the little interlopers with all the affection she would manifest for her own natural offspring. For the first few days the pups are kept in the hut, the ewe suckling them morning and evening only; but gradually, as she be-

* Hungary and Transylvania, by John Paget, Esq., vol. ii., p. 12, *et supra.* † Page 241.

comes accustomed to their sight, she is allowed to run in a small enclosure with them until she becomes so perfectly familiar with their appearance as to take the entire charge of them. After this they are folded with the whole flock for a fortnight or so, they then run about during the day with the flock, which after a while becomes so accustomed to them, as to be able to distinguish them from other dogs—even from those of the same litter which have not been nursed among them. The shepherds usually allow the slut to keep one of a litter for her own particular benefit; the balance are generally destroyed.

After the pups are weaned, they never leave the particular drove among which they have been reared. Not even the voice of their master can entice them beyond sight of the flock; neither hunger or thirst can do it. I have been credibly informed of an instance where a single dog having charge of a small flock of sheep, was allowed to wander with them about the mountains, while the shepherd returned to his village for a few days, having perfect confidence in the ability of his dog to look after the flock during his absence, but with a strange want of foresight as to the provision of the dog for his food. Upon his return to the flock, he found it several miles from where left, but *on the road leading to the village*, and the poor faithful animal in the agonies of death, dying of *starvation*, even in the midst *of plenty*: yet the flock had not been harmed by him. A reciprocal affection exists between them which may put to blush many of the human family. The poor dog recognized them only as brothers and dearly loved friends; he was ready at all times to lay down his life for them; to attack not only wolves and mountain cats, with the confidence of victory, but even the bear, when there could be no hope. Of late years, when the shepherds of New Mexico have suffered so much from Indian marauders, instances have frequently occurred where the dog has not hesitated to attack his human foes, and although transfixed with arrows, his indomitable courage and faithfulness have been such as to compel his assailants to pin him to the earth with spears, and hold him there until dispatched with stones.

In the above instance the starving dog could have helped himself to one of his *little brother* lambs, or could have deserted the sheep, and very soon have reached the settlements where there was food for him. But faithful even unto death, he would neither leave nor molest them, but followed the promptings of his instinct to lead into the settlement; their unconsciousness of his wants and slow motions in traveling were too much for his exhausting strength.

These shepherds are very nomadic in character. They are constantly moving about. their camp equipage consisting merely of a kettle and a bag of meal; their lodges are made in a few minutes, of branches, &c., thrown against cross-sticks. They very seldom go out in the day-time with their flocks, intrusting them entirely with their dogs, which faithfully return them at night, never permitting any stragglers behind or lost. Sometimes different flocks *are* brought into the same neighborhood owing to scarcity of grass, when the wonderful instincts of the shepherds' dogs are most beautifully displayed; and to my astonishment, who have been an eye-witness of such scenes, if two flocks approach within a few yards of each other, their respective proprietors will place themselves in the space between them, and as is very naturally the case, if any adventurous sheep should endeavor to cross over to visit her neighbors, her dog protector kindly but firmly leads her back, and it sometimes happens, if many make a rush and succeed in joining the other flock, the dogs under whose charge they are, go over and bring them all out, but, strange to say, under such circumstances they *are never opposed by the other dogs*. They approach the strange sheep only to prevent their own from leaving the flock, though they offer no assistance in expelling the other sheep. But they *never permit* sheep not under canine protection, nor dogs not in charge of sheep, to approach them. Even the same dogs which are so freely permitted to enter their flocks in search of their own, are driven away with ignominy if they presume to approach them without that laudable object in view.

Many anecdotes could be related of the wonderful instinct of these dogs. I very much doubt if there are shepherd dogs in any other part of the world except Spain, equal to those of New-Mexico in value. The famed Scotch and English dogs sink into insignificance by the side of them. Their superiority may be owing to the peculiar mode of rearing them, but they are certainly very noble animals, naturally of large size, and highly deserving to be introduced into the United States. A pair of them will easily kill a wolf, and flocks under their care need not fear any common enemy to be found in our country.

J. H. Lyman."

Mr. Kendall* speaks of meeting, on the Grand Prairie,

—a flock numbering seventeen thousand, which immense herd was guarded by a very few men, assisted by a large number of noble dogs, which appeared gifted with the faculty of keeping them together. There was no running about, no barking or biting in their system of tactics; or the contrary, they were continually walking up and down, like faithful sentinels, on the outer side of the flock, and should any sheep chance to stray from its fellows, the dog on duty at that particular post, would walk gently up, take him carefully by the ear,

* Vol. I., p. 268.

and lead him back to the flock. Not the least fear did the sheep manifest at the approach of these dogs, and there was no occasion for it.

These noble animals seem, according to these and various other corresponding accounts I have seen of them, to leave nothing to desire in the way of a sheep-dog, either for guarding or managing flocks. They would be invaluable in our Southern States, to protect the flocks from the cur-dogs which so often attack them, and from the occasional wolves. I hope efforts will be made to introduce them into our country, and then they should be bred in the utmost purity.

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South American Sheep-Dog.—Similar to the preceding in character and habits, are the sheep-dogs to be found in various parts of South America. They, too, are undoubtedly an offshoot from the Spanish stem. The following interesting account of them is from Darwin's Journal:

"While staying at this estancia (in Banda Oriental), I was amused with what I saw and heard of the shepherd dogs of the country. When riding, it is a common thing to meet a large flock of sheep guarded by one or two dogs, at the distance of some miles from any house or man. I often wondered how so firm a friendship had been established. The method of education consists in separating the puppy, when very young, from the bitch, and in accustoming it to its future companions. A ewe is held three or four times a day for the little thing to suck, and a nest of wool is made for it in the sheep-pen.—At no time is it allowed to associate with other dogs, or with the children of the family. The puppy, moreover, is generally castrated; so that when grown up, it can scarcely have any feelings in common with the rest of its kind. From this education it has no wish to leave the flock, and just as another dog will defend its master, man, so will these the sheep. It is amusing to observe, when approaching a flock, how the dog immediately advances barking—and the sheep all close in his rear as if round the oldest ram. These dogs are also easily taught to bring home the flock at a certain time in the evening. Their most troublesome fault when young is their desire of playing with the sheep, for in their play, they sometimes gallop their poor subjects most unmercifully. The shepherd dog comes to the house every day for some meat, and immediately it is given to him he skulks away as if ashamed of himself. On these occasions the house dogs are very tyrannical, and the least of them will attack and pursue the stranger. The minute, however, the latter has reached the flock, he turns round and begins to bark, and then all the house dogs take very quickly to their heels. In a similar manner a whole pack of hungry wild dogs will scarcely ever (and I was told by some, never), venture to attack a flock guarded even by one of these faithful shepherds. The whole account appears to me a curious instance of the pliability of the affections of the dog race; and yet, whether wild, or however educated, with a mutual feeling of respect and fear for those that are fulfilling their instinct of association. For we can understand on no principle the wild dogs being driven away by the single one with its flock, except that they consider, from some confused notion, that the one thus associated gains power, as if in company with its own kind. F. Cuvier has observed that all animals which enter into domestication consider Man as a member of their society, and thus they fulfil their instinct of association. In the above case the shepherd dogs rank the sheep as their brethren; and the wild dogs, though knowing that the individual sheep are not dogs, but are good to eat, yet partly consent to this view, when seeing them in a flock, with a shepherd dog at their head."

—

Other large races of Sheep-Dogs.—There are one or two fine species in France, as those of Brie, and Auvergne. In a letter from G. W. Lafayette, to John S. Skinner, Esq., the latter are pronounced equal to the Spanish dogs.* Large powerful races, everywhere possessing the same general characteristics, are to be found in almost every country excepting our own, where the fine-wooled breeds of sheep have been extensively introduced. With a commerce extending to all the maritime nations of the world, singular it is that so little pains have been taken to introduce them.

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The English Sheep-Dog.—The following are portraits of a Drover's dog,

* See Farmers' Library, Vol. i., p. 465.

and a Scotch Colley slut, imported by B. Gates, of Gap Grove, Lee Co. Illinois. They are taken from The Farmers' Library.*

Fig. 72.

DROVER'S DOG, AND COLLEY SLUT.

The Drover's dog, or English sheep-dog, or Butcher's dog—for by all of these names is he known—is considerably smaller than the species or families heretofore described, but he is a larger and more powerful dog than the Colley. Mr. Gates, in the communication accompanying the portraits, remarks:

"Much has already been written on the intelligence of the Scotch Colley. My opinion is that the English "Butcher's dog" is no way lacking on that point. Any reader who has visited Smithfield market in London, on Monday or Friday, will, no doubt, have formed the same opinion. There you have an opportunity of seeing a number of these useful animals at their work. It would, in fact, be almost impossible to conduct this market without their aid. There a vast number of different animals are brought for sale from all parts of the country, to supply this great metropolis, and are collected in the smallest possible space. The difficulty of keeping them from mingling with others falls principally on the dog. If one slips away, or a particular one is wished to be caught, it is pointed out to him, and is returned back, or held till the owner takes it—the dog always holding them by the side of the head, so as not to bruise the body. By a word or motion of the hand, they will run over the backs of the sheep, to stop them or turn them in a different direction. I have often admired, with astonishment, their quick and intelligent actions. They appear to read the thoughts of their master by his countenance, for their eye is continually on his, or the flock. Nothing else can attract his attention when he has work to perform, and at times I have thought he acted with more judgment than the owner. . . . The breed of "Boxer," (whose portrait is above given,) is sometimes called the Drover's or Tailless breed."

Mr. Colman, in one of his Reports, says:

"For a week or more before the tryst, the roads leading to Falkink will be found crowded with successive droves of cattle and sheep, proceeding to this central point; and it is extremely curious on the field to see with what skill and care the different parties and herds are kept together by themselves. In this matter the shepherds are generally assisted by

* Vol. i., p. 575.

their dogs, which appear endowed with a sagacity almost human, and almost to know every individual belonging to their charge. They are sure, with an inflexible pertinacity, to bring back a deserter to the flock."

Mr. T. C. Peters, (now of Buffalo, N. Y.,) on his return from Europe, a few years since, brought over a Drover and a Colley. His testimony to their extraordinary value will be found in the American Agriculturist, vol. iii., page 76.

Fig. 73.

THE COLLEY.

The Scotch Sheep-Dog or Colley.—The light, active, sagacious Colley admits of no superior—scarcely of an equal—where it is his business merely to manage his flock, and not to defend them from beasts larger than himself. Mr. Hogg says that "a single shepherd and his dog will accomplish more in gathering a flock of sheep from a Highland farm than twenty shepherds could do without dogs. Neither hunger, fatigue, nor the worst treatment will drive him from his master's side, and he will follow him through every hardship without murmur or repining."

The same well-known writer, in a letter in Blackwood's Magazine, gives a most glowing description of the qualities of his Colley, "Sirrah." One night a flock of lambs, under his care, frightened at something, made what we call in America a regular *stampede*, scattering over the hills in several different bodies, "Sirrah," exclaimed Hogg in despair, "they're a' awa!" The dog dashed off through the darkness. After spending, with his assistants, the whole night in a fruitless search after the fugitives, Mr. Hogg commenced his return to his master's house. Coming to a deep ravine, they found Sirrah in charge, as they at first supposed, of one of the scattered divisions, but what was their joyful surprise to find that not a lamb of the whole flock was missing!

Of the stanch devotedness of the Colley, under any and all circum-

stances, Mr. Peters gives, in the American Agriculturist, the following characteristic illustration, copied from a Scotch paper:

"The master of the bitch purchased at a fair some eighty sheep, and having occasion to stay a day longer, sent them forward and directed his faithful Colley to drive them home, a distance of about 17 miles. The poor bitch, when a few miles on the road, dropped two whelps; but faithful to her charge, she drove the sheep on a mile or two farther—then allowing them to stop, she returned for her pups, which she carried some two miles in advance of the sheep, and thus she continued to do, alternately carrying her own young ones, and taking charge of the flock, till she reached home. The manner of her acting on this occasion was gathered by the shepherd from various persons who had observed her on the road."

The Colleys are not now uncommon in the Northern States, and I have often seen proofs of their singular sagacity in collecting, driving, and guarding sheep, and in catching out one from the flock when directed by their masters. I have often seen one drive a flock of fifty or sixty sheep through a crowed street, encountering teams, pedestrians, and other dogs at every step—without the slightest assistance.

Accustoming the Sheep to the Dog.—It is a mistake to suppose that a trained sheep-dog will manage any strange flock, however wild and unaccustomed to such company. The sheep must be gradually made acquainted with, and accustomed to the dog. They must know—and they will readily learn it—that he is their friend, their guardian and protector, instead of that hereditary enemy which their instinct teaches them to fly from. A want of knowledge of this fact has frequently led to disappointment and disgust, to a giving up of the valuable dog which it has cost pains and money to procure. Mr. Skinner relates a ludicrous incident of Mr. Jefferson, arising from his not being apprized of this fact. A thoroughly broken sheep-dog had been sent him from abroad, and the great Sage of Monticello, after having held forth *ore rotundo* to some visitors, on the value of these dogs, and their immense convenience—nay, their indispensability in managing flocks, led forth his guests to give a practical exemplification of the qualities of his dog. At the word, the latter made for the sheep. The terrified animals fled in all directions, some of them dashing themselves over precipices and breaking their necks. The dog either shared the same fate, or, mortified at his failure, felt his pride too deeply wounded to return. Mr. Jefferson never recovered him!

WOOL DEPOTS.

Commission merchants who confine their operations exclusively to the sale of Wool, have opened large stores or "Dépôts," at three or four points in the Northern States. Of the origin of this system, Mr. H. Blanchard, of Kinderhook, N. Y., thus spoke at the Agricultural meeting at the Assembly Chamber, Albany, Feb. 3, 1848:

"From facts that were ascertained by Hon. J. P. Beekman, (then President of the N. Y. State Agricultural Society,) at the State Fair held in Poughkeepsie, in 1844, he became convinced that the growers of Dutchess county, by reason of the superior facilities afforded them for the sale of their fine wools, were procuring from six to eight cents per pound more than many wool-growers in other sections of the State who produced the same quality of wool. The large quantity of fine wool grown in that county, offered great inducements for manufacturers and purchasers of fine wool to make that a place of resort to obtain their supplies, and thus a fair competition was awakened, which resulted in a just appreciation of the relative value of their wools, and remunerating prices to the fine wool grower. Soon after Dr. B.'s return, the evils consequent upon the system of selling wools in our county, as well as elsewhere, became a matter of discussion between him and other wool-growers in our vicinity and myself, the result of which was a request from them that I would open what we now term a "Wool Dépôt." The *principles* involved in the dépôt system are not new, it being conducted upon those of a commission business; but it is only the details and appli-

cation of these principles to wool when received direct from the grower, that had never before in this country been applied in the same discriminating manner, and with as little expense as by this system."

The objects and advantages of the system, and the method of conducting these establishments are clearly set forth in the following letter from my friend Mr. Peters, to whom, as a keeper of one of these Dépôts, and a gentleman of conceded ability—as well as skill, energy and success in this and in his other business operations—I thought it appropriate to apply for this information.

H. S. Randall, Esq. Buffalo, N. Y., Dec. 16, 1847.

My Dear Sir: Your kind favor of the 12th inst., making inquiries relative to the Wool Dépôt system, is before me.

It will give me pleasure to answer your queries, not that by so doing I can add anything to the exceeding great value of your Letters to the whole country, and especially to the South and West—yet from my own experience as a wool-grower, and in the management of a Wool Dépôt which I established at this place last spring, I may give some information that will be useful to your readers, and may they be millions. In so doing, I will give you 1st, An account of the object; 2d, The method of doing business; and 3d, The advantages of the Wool Dépôt system.

The Object.—Upon no sheep is the wool exactly alike over the whole body; nor is the wool exactly alike upon any single flock. In most flocks there is a great diversity—greater than there should be for the farmer's profit. There is, then, a variety of grades of wool in every flock, and in every section of the country where wool is grown.

Manufacturers first grade the wool; that is, sort the fleeces, making from five to eight or nine different grades. Each fleece is then opened, and stapled, or sorted into the various grades of the factory. Some manufactories use only the finest, others only the coarsest, and others again use only one kind of the intermediate sorts, so that from a single flock, I sold this year wool to five different manufacturers, no one wanting or working the kind that the other wanted.

The object of the Wool Dépôt is to sort and arrange the wool, that the manufacturer can readily obtain the particular kind adapted to his machinery, and to obtain for each sort its fair market value.

Method of doing Business.—The system originated with Mr. H. Blanchard, at Kinderhook, some three years ago. Last year, we sent our wool to Mr. Blanchard, and during the winter I visited his establishment, and was so well satisfied with the operation of it, and of the vital importance of the system to the wool-growers everywhere, that I at once made arrangements to open one at this point. I accordingly commenced operations in the spring, and have been successful beyond my most sanguine expectations.

I have a competent and experienced sorter, and when wool is sent in, it is at once sorted in the fleece, each sort weighed, and entered in a book under the name of the person sending it.

I have adopted Mr. Blanchard's method of sorting, as experience has shown that to be the best, under all circumstances. I make, then, five sorts, taking full-blooded Merino for No. 1, and grading down to coarse common wool, which is No. 5. Saxony I grade into Extra, Prime 1, and Prime 2. Then there is a kind of wool which is admirable for combing, and another kind that is wanted for De Laines;—these form five more sorts, making thus ten sorts. But as there is such a difference in the condition of wool when brought into the Dépôt, I usually make two sorts of each number. Thus I have No. 2, and No. 2 A. No. 2 is usually good, but No. 2 A is of the same grade, but is in better condition, every way a choice article, but still not fine enough to go into a higher grade. The wool is actually worth two or three cents per lb. more than the other number to which it belongs, and but for making this distinction, would not bring its full value. When the wool is properly sorted, it is piled up in a manner that will enable the purchaser to see it at a good advantage;—insured, and held until the market requires it. I make all my sales here, and for cash. When the sales are closed, an account is made out and sent to those who have sent me their wool; usually, an account is rendered as fast as any part of a man's wool is sold. I have often been asked, how I could tell whether any man's wool was sold, unless the whole of a sort was sold at a time. It is very easy. Suppose A. has 100 lbs. of No. 1, and I have sold 20,000 lbs. out of 40,000 lbs.—that being the whole amount in the Dépôt. I have sold one-half of each man's No. 1, and I turn to A.'s account and give him credit for 50 lbs. sold, and so go through and credit each man with his proportion of that number sold.

The charges are, for receiving, sorting, and selling, one cent per lb., and the insurance—which is usually about 30 cts. on $100, for three months. Cartage from the dock is usually three cents per bale. The sacks are returned or sold at the option of the owner. They are

usually worth about fifty cents, more or less, according to their condition. Each man's wool is carefully examined; if put up in bad order, it is so noted, and a deduction made by the sorter, to make it as it should be. So that it is no object for a man to send to the Dépôt wool in a bad condition.

THE ADVANTAGES.—The foregoing facts would seem to be so plain that it cannot be necessary to refer to the advantages. No man, however, is more at the mercy of the speculator, than the wool-grower. The very fact that he has so many kinds of wool in his clip, prevents him from ascertaining the market value of the whole, for being in comparatively small quantities, he has not enough, if ever so well sorted, to make it an object for the different manufacturers to visit him. He is therefore compelled to sell his whole clip at the price of his present quality, and at prices from five to fifteen cents per lb. under the real market value of his wool. Allow me to illustrate by an example. A farmer has his wheat, corn, oats, and barley, all mixed, and carries it to market in this condition. Will anybody give him the value of each kind of grain? On the contrary, they would not be willing to pay even the value of the cheapest kind. And yet each kind by itself has a market value. Precisely in the same situation is the wool-grower, except that he has no means of knowing the value of the various sorts of wool, except from the speculator.

The advantage of the Dépôt system, then, is, that there his wool is properly sorted. The wheat is separated from the corn, the corn from the oats, and the oats from the barley, and each is made to bring its fair market value. By having an extensive correspondence among the manufacturers throughout the country, I am kept constantly advised of the market; and knowing the price of cloth in the cities, I am enabled to know to a certainty what the price of the various grades of wool should be.

When the manufacturer can get the kind of wool he wants, and in large quantities, he is willing to pay, and does pay a better price than when he has to buy that which he does not want, to get the right sort. It also equalizes the market, and brings the producer and the manufacturer together, without being compelled to pay agents or speculators, and prevents that fluctuation of the market which is always produced by speculation.

But there is another very great advantage growing out of the system. It enables the wool-growers in the various sections of the country to compare wool, and to know who has really the best and most profitable kinds of sheep. It has been strikingly manifest with me this season. For I have been enabled to point out to people in different States West, where they could find the most profitable sheep, by the wool which had been sent me. And in one instance men had been over five hundred miles after sheep, and paid high prices, when there were sheep in their own town worth double the money.

There is no difficulty in sending wool here from any part of the country bordering upon the Ohio, or its tributaries. The expense of transportation will range from one to one and a half cents per lb.—depending much upon the bargain made with the clipper. I have received wool this year from all the Western States, in some instances as far West as the Mississippi River, and the average cost for freight has been about one cent per lb.

It was urged by many last spring that this city was not a good point, inasmuch as it was not sufficiently central in its location. For nothing is more certain, than that a wool Dépôt, to be successful, must be so located as to command a large amount of wool. The larger amount you can concentrate at a point, the more rapid and sure will be your sales. To this city the products of the West naturally tend, and to this point the producer can calculate with great certainty when, and at what expense it will arrive. But after its trans-shipment here, expenses accumulate, without any corresponding benefit. And it is peculiarly so, in regard to wool, coming as it often does in bad order, sacks torn, broken, and wet.

But I have made my letter already longer than I intended, and in speaking of my own Dépôt have perhaps gone more into detail than is necessary.

This much I must be permitted to say to every wool-grower, that the Wool Dépôt system, properly conducted and patronized, is indispensable to ultimate and profitable success.

I remain, my dear sir,

Very sincerely yours,

T. C. PETERS.

Messrs. Perkins and Brown have a Dépôt at Springfield, Mass.; and I believe the establishment of two or three others is in contemplation, by companies or individuals.

Conducted with skill and fidelity, there can be but little doubt that these establishments are alike beneficial to the wool-grower and manufacturer. That Mr. Blanchard's and Mr. Peters's have thus far been so conducted, there is not the least doubt. Of the other I know nothing, though report speaks well of it. The design was not regarded with much favor, in the outset, by many of our most extensive wool-growers. They preferred to "do

their own business," and not "pay the wages of an intermediate agent." But the advantages derived from selling the wool in sorted lots, have been found to far more than overbalance the one cent per pound paid to the "agent" or Dépôt keeper, and the system is rapidly gaining favor. Many of our most experienced wool growers in this State—men the most competent to favorably dispose of their wool—have sent their wool to Messrs. Blanchard and Peters, and I have yet to see or hear of the first person who has been disappointed in the result.

If wool Dépôts are beneficial in the North, where the agents of different manufacturers, and "speculators," visit every man's barn to bid on his wool—and among a class of growers, too, who, from long experience, are familiar with the qualities and comparative values of the staple—how much more beneficial would they be to regions in which the growers are so scattered that they are rarely visited by traveling agents—or if so, not in numbers sufficient to produce that competition which would *compel* them to offer the fair market value of the article: and where, perhaps, in many cases, the growers themselves have not sufficient experience to determine the exact grade of their own clips, even supposing them correctly notified from time to time from abroad, of the market value of the several grades. *The Dépôt system, in my judgment, removes the great and only serious obstacle to successful wool-growing in the South.*

It is not necessary that Dépôts be established *in the Southern States*, to have those States reap the full benefit of the system. For the present, and for some time to come, at least, the North will furnish the *best home market* for fine wools. The wool therefore must, until some changes take place, come to the North before it is sold; and the transportation must be equally subtracted from the avails, whether the sale is effected at home or at a Northern wool Dépôt. Indeed, it would be *better* to store it in a Dépôt at Kinderhook or Buffalo, than at Charleston or Nashville. And this is for the reason that the two former are much nearer to, and can be more speedily visited by the principal woolen manufacturers of the United States, than the latter. The New-York or New-England manufacturer would be little likely to send an agent to Charleston or Nashville, if he could supply his wants equally cheaply (with the addition of cost of transportation), from Buffalo, Kinderhook, or Springfield. And if supplied any more cheaply at the former places (price of transportation excepted), be it remembered, it would be so much *unnecessarily taken out of the pocket* of the grower.

Should the South at any future day find it more for her interest to ship her wools to Europe, the above considerations will cease to be valid. She would then want Dépôts as much as now, for far more gain, proportionably, is made by *sorting wool* for the foreign, than the American markets. But in that event, the Dépôts would assume a different character, and they would be most appropriately located at the port whence the wools were shipped.

A CORRECTION.—MR. RUFFIN.

In the beginning of Letter VI., I made the following remark in relation to Hon. Edmund Ruffin—"He seems to think lime, of itself, adequate to the full and permanent amelioration of the tertiary soils."—This remark was made on a somewhat too hasty inspection of some of Mr. Ruffin's positions in the Agricultural Survey of South Carolina. Since writing it, I have had the pleasure of reading for the first time Mr. R.'s highly valuable work on Calcareous Manures, and find that I was in error in the statement above made.

NOTE IN RELATION TO AUSTRALIA.

Since the preceding Letters were completed, the exceedingly interesting article from the (English) Farmers' Magazine, which is published below, has met my eye. It will be seen from it that the conclusions arrived at by me (see page 123,) in relation to the vast increase in the trans-Atlantic demand for wool and woolens, are in a rapid course of verification. I wrote from statistics extending down to 1840. In that year the English import of wool was forty-six millions of pounds. In 1845, according to the subjoined authority, it was seventy-six millions of pounds. And this rapid increase took place, notwithstanding the vast extension in the woolen manufactures in other nations, particularly in Germany, France, Spain and Belgium. The extract given from Waterton's "Cyclopædia of Commerce," asserting the improbability of a much greater extension of the English woolen manufactures, "unless new markets shall be opened," may be true. But new markets are yet to spring up in Central and Northern Asia, and even in Northern Europe, which will, in the aggregate, require an increase of woolen manufactures which the boldest calculator now scarcely dreams of. For the reasons for this opinion, see page 123.—Whether England is to supply a greater or less portion of this increasing demand remains to be seen. If she continues as well prepared as she now is to compete with other manufacturing nations, doubtless she will contribute her full share to that supply.

It will also be seen, from the annexed paper, that what I predicted (see page 121) in relation to the prospective competition (from the year 1840) in wool-growing, between the densely populated countries of Western Europe and those in newer settled regions, where land is cheap and population comparatively sparse, has already come to pass. Spain, and even Germany, which in 1840 supplied England with nearly twenty-two million pounds of wool—nearly half of the whole import of the latter—have now been driven almost entirely out of the English market! But, says the *Sydney Herald*, Germany, Spain, etc., have renewed the contest in another form: they have extended their manufacturing operations, and now manufacture their own wool. Admit this: but if German wools cannot compete with others in the English market, which are brought from fifty times the distance, they cannot compete with them even in the German market, unless the latter are kept out by duties. The German manufacturer, then, in working up home wools, pays more for his raw material than the English manufacturer, and he cannot, therefore, compete with him in foreign markets, nor even in the home one, without a protective Tariff which would raise the price of the English to that of the German article.—Tariffs *materially* enhancing the cost of the necessaries of life will not long be tolerated by the consuming millions, in regions where civilization has penetrated.

It seems that Australia and Van Diemen's Land are the successful competitors which have driven Germany and Spain from the English wool market. The views set forth by me in Letter IX. in relation to the advantages of the former for wool-growing compared with those of Hungary, Southern Russia, North and South America, remain the same; indeed, a careful review of my positions has served to farther convince me of their correctness. The *character of the population*, and the better commercial regulations of Australia, have given her a present advantage over new rivals in the Old World; and America has not yet entered the field of competition. When the Anglo-Saxon of North America enters the lists with the Anglo-Saxon of Australia, natural advantages will not, as now, be

overbalanced by superior energy and enterprise. The Anglo-Australian will, to say the least of it, meet his full equal in these particulars. And, on the other hand, there is not a rational doubt that the *natural and other present advantages of all kinds are on the side of the Anglo-American.* The portion of North America included in the proper wool-growing zone is immensely greater than in Australia; our climate, all things considered—considering the occasional terrible drouths of Australia—is the best; our lands are cheaper, and will certainly average as good, including our whole Atlantic coast, and including only our territory between the Apalachians and the Rocky Mountains, our land will average by far the best; labor is not dearer among us; we are not a quarter as distant from the English markets; the wool from all parts of our immense interior, instead of being dragged long and expensive journeys in "bullock drays," is already whirled along by steam, or boated on canals or rivers to the seaboard, at a comparatively trifling expense. It would be difficult to name a particular, excepting in the two-cent duty, in which large portions of the United States have not the advantage over Australia for supplying the English wool market, and in other European markets we have perhaps *every* advantage over that Colony.

The Australian Wool Trade*—[By *Wm. Westgarth,* Esq.]—The importance at present assumed by the Australian wool trade in the lists of British Commerce, demands some degree of attention in the history of an Australian settlement. I shall, therefore, devote the present chapter to a short account of this branch of Commerce, in its capacity both of an export from the Australian Colonies and an import into the British market.

In the year 1836, the quantity of wool exported from Sydney amounted to 3,700,000 lbs. weight. The proportion for the Port Philip district, included in this amount, could not, at so early a period of her existence, have exceeded 60,000 lbs. weight. Five years afterward the annual produce had attained to 1,578,000 lbs.; and the lapse of a similar period, bringing us down to the year 1846, exhibits the astonishing quantity of 7,400,000 lbs.† During this interval of ten years the quantity of wool exported from Sydney, exclusive of any from Australia Felix, had increased from three and a half millions to nearly twelve millions of pounds weight.

The importation of wool into the British market appears, indeed—like the rise of the Australian Colonies—to be but a business of yesterday, and one, among numerous other instances, of the wonderful extension of Modern Commerce. In 1820, the quantity imported was under ten millions of pounds weight; in 1845, it had risen to seventy-six millions. The proportion from the Australian Colonies in the former year was the one-hundredth part; it now forms nearly one-half of the whole importation‡; and at the steady and rapid ratio of the present increase of Australian wool, the lapse of a few years will exhibit a quantity far greater than the united total of the wool at present imported into Britain from every quarter of the world. The following Table exhibits the respective averages, in round numbers, for each period of five years from 1826 to 1845; the numbers representing millions of pounds weight:

Average of years.	Foreign Wool.	Colonial Wool.	Total
1826–30	25	2	27
1831–35	34	4	38
1836–40	44	10	54
1841–45	36	22	58
1846	34	30	64

This Table illustrates the extraordinary progress of the colonial production, three-fourths of which are derived from Australia and Van Diemen's Land.

The periodical public sales of colonial wool, which now occupy so important a position among the commercial occurrences of the British Capital, date their origin only so lately as the year 1817. The prices at that time, and for some subsequent period, were only from 2d. to 3d. per lb.; and it was not until twelve or fourteen years afterward that any important advance took place in the value of this commodity. The fine quality of the Australian wool

* From a new work in the press, on Port Philip.

† The wools occasionally sent from Port Philip by way of Sydney, and appearing in the Customs' returns as Sydney exports, are here allowed for. The season or year is taken as ending on the 10th October, as the usual date of 31st December falls in the midst of the wool shipments, and cannot fairly represent the quantities and ratio of progress of each year.

‡ In 1846, the relative quantities imported into Britain were, in round numbers, thirty-four millions of pounds of foreign wool and thirty millions of colonial. For the present year the colonial may be safely assumed at somewhat more than half the importation.

began soon after to attract notice, and in 1835 and 1836 to excite the attention even of foreign manufacturers. From very small beginnings the extent of the periodical auction sales gradually increased. An unprecedented number of 750 bales was announced for one series of sales in 1825; and for some years afterward 400 bales were considered to form a very extensive sale. But in July, 1835, 3,746 bales were brought forward, realizing for the better qualities the considerable rates of from 2s. 6d. to 3s. 8d. per pound; and at the sales of the same month in 1844, there were exposed no less than 31,358 bales.*

The celebrated wools of Australia are derived from two principal breeds of sheep, the Merino and the Saxon. The former is the finest in quality, but it may be doubted if an adequate price has been hitherto derived to compensate for the lighter weight of the fleece. In the Sydney district, attention was chiefly bestowed on the Merino; in Van Diemen's Land, on the Saxon; and the Port Philip district received a share of both, as the colonists from either locality transported their flocks to her pastures. This mixture of breeds was still farther increased by occasional crosses with the Leicester and South-Down. In fact, from the numbers of inexperienced persons who entered on the occupation of sheep farming in this new settlement, and, without any fixed principles, carried on a mere random system of breeding, the greater portion of the wool consists of every shade of quality that natural accidents could produce. The abundant pasturage of Port Philip appears also to affect the pure Merino wool of the Sydney district, which in the former locality acquires a more open appearance, loses somewhat of its fineness, and increases about a quarter or half a pound in the weight of the fleece. The average weight of the good qualities of Port Philip fleeces, after washing, is from 2½ to 2¾ lbs.; of the Sydney fleeces about 2¼ lbs. There has been for several years a desire to introduce a greater uniformity of quality in the fleeces of each particular grower, and on the whole an inclination to adhere to the production of the finer qualities of wool.

[Here follow details of the Australian method of washing and other preparations for shearing, which are omitted, as they conform in every important particular to the directions laid down in these Letters for those processes.]

The wool is now ready to be packed and dispatched to the port of shipment. Each fleece is cleared of the locks and clippings or other unseemly portions, and is usually tied with a piece of string, and tightly squeezed into bags containing about one hundred each, or from two hundred and fifty to three hundred pounds weight. The ponderous bullock dray is now yoked to its team of eight or a dozen oxen, and charged with an ample load of the golden fleece, is dispatched from the station on its annual and protracted mission to the port of shipment.

The wool on its arrival in town is now generally classed and re-packed at an establishment for that purpose, unless this process has already been competently performed at the station.—The classification distinguishes only the entire fleece; it is not attempted to proceed to a minuter distinction of qualities by breaking the fleeces. When intended for sale, the wool, on its arrival in town, is conveniently exhibited in the various bins of the sorting establishment, and its quality and condition are fairly ascertained. At the establishment of the Messrs. Bakewell, in Melbourne, the wool is assorted first into the two leading divisions of clothing and combing, and each of these descriptions is run out into five qualities, the fifth or lowest being the coarse Leicester breeds. Extra fine lots are classed by themselves; *super*-greasy, or kempy, or other defective fleeces, are also classed apart. The charge for sorting is ¼d. per pound. The usual charge for hand-washing is 1d. per pound on the weight returned, and for scouring 1d. to 1½d. per pound. The system of re-packing is also of use in exposing any wet or damp that the wool may have acquired on the way from the interior, in which condition it is in danger of heating and even of originating fire in the hold of a vessel during a lengthened voyage.

The shipping season for the Australian staple commences toward the end of October; but only a few solitary drays have succeeded in reaching town during that month. Considerable quantities have arrived by the end of November; and during the two succeeding months there is a continuous succession of vehicles pouring with their voluminous loads into the various ports of the district.† These arrivals begin to fall off in February; but during that and the two succeeding months considerable quantities continue to be shipped, including the later shorn fleeces of the young lambs. The shipment of other exports, which are comparatively of unimportant amount, terminates with that of the wool. A solitary vessel may linger till July or August, when the transactions of the season are finally closed.

The following from a late number of the *Sydney Herald* may be well appended to the above:

* This included a small quantity of foreign wool. The proportion from Australia and Van Diemen's Land on this occasion was 26,134 bales. The early sales were held at Garraway's, and continued there from 1817 to 1843, when the locality was transferred to the Hall of Commerce, where they still continue. The first bale at the first sale, from the novelty of the circumstance, realized 10s. 6d. per pound.

[Mark Lane Express, 7th, 14th, and 21st Oct. 1844.

† There are five shipping ports in Australia Felix; namely, Melbourne, or its port of Williamstown, Geelong, Portland, Belfast, and Port Albert, or Alberton, in Gipps's Land. The quantity for the present year (1847) may be estimated at about 28,000 bales, of which five-sixths are shipped at Williamstown and Geelong.

"Our two time-honored competitors in the production of fine wool, Spain and Germany, have been fairly beaten out of the field. The climate and pasturage of these colonies, and of the congenial settlement at the Cape of Good Hope, backed by the energies of their Anglo-Saxon race of flock-masters, have more than compensated for our greater distance from British markets. We have been enabled to supply a good article—in vast and ever-increasing quantities—and at prices which, notwithstanding the cost of carriage, have, through our facilities of production, left us a remunerating profit, but which our ancient rivals have found to be insufficient to replace prime cost.

"But although Spain and Germany have ceased to vie with us as sellers of the raw material in England, they have done so only to renew the contest in another form. They have enlarged their manufacturing operations. Since they can no longer sell their fleece at a profit, they have resolved on working it up in their own looms. To that extent, therefore, they will cease to import wrought woolen fabrics; and in so far as their imports were from Great Britain, there will be a corresponding decrease in the British consumption of our wools. The woolen cloths imported into those two countries from Great Britain, in the year 1841, amounted, in declared value, to £1,026,431 sterling: and if we add the quantities imported in the same year into Holland and Belgium, the amount would have been about a million and a half. We must therefore be cautious, as prudent men, not to allow our spirits to be too much exhilarated by the apparent victory we have gained over 'our hereditary enemies,' seeing that, though seemingly vanquished, they have but shifted their position and varied their tactics.

"A judicious writer says, in 1844: 'Of late years cottons have, from their cheapness, in a great degree superseded the lower qualities of cloths—a circumstance which, joined to the increasing rivalry of France, Germany and Belgium, *renders it improbable*, unless new markets shall be opened in China or elsewhere, *that much extension will in future be given to our manufacture of woolen cloths.*'*

"While, however, the Spanish and the German wool-growers have thus ceased (or are expected very shortly to cease) to compete with us as exporters to England, another competitor has sprung up in a new and quite unexpected quarter. In addition to corn, breadstuffs, rice, tobacco, cotton, sugar, and an endless catalogue of 'notions,' in which Brother Jonathan has hitherto prided himself as a mighty producer, he has now taken it into his head that he can breed sheep and export wool on a large scale. And it would seem that in England his whim has by no means been thought whimsical. For, say certain Liverpool brokers to him, under date of 3d September, 1846: 'The arrivals of wool from the United States last year, for the first time to any extent, *made quite a sensation in this country*, as it was generally considered that you required to import these qualities, and there was no knowledge that your growth of wool was of such importance. *We have seen it estimated at sixty-five million pounds*;† and from your vast (and to us almost incredible) means of production, we believe *it will cause a kind of revolution in the wool trade.*'

"Jonathan's own opinion of the matter is thus expressed through the medium of the New-Orleans *Commercial Times*: 'Wool can be grown as cheaply, and to as great advantage, in the cotton-growing States as in any part of the world. There is nothing in the climate to prevent it. If it may be found desirable to grow that of the finest grades, it can be done without fear of the animals becoming covered with hair in a few years.' He has evidently some misgivings, however, as to the policy of his attempting the finest grades, for he immediately subjoins, 'However, we are inclined to think that wool *of a coarser quality will be found most profitable*, mutton being also an object with us.'

"If the United States already produce four times the quantity of wool that we do, and if there is a reasonable chance of their producing it of a quality equal to ours, and at no greater cost, then have we indeed much to fear from their formidable rivalry. The vast extent of their territory, the almost illimitable resources of their soil and climate, the indomitable spirit of their citizens, combined with their proximity to the British market, will render their competition, if successful at all, successful in no ordinary degree.

"'Wool,' says another Liverpool correspondent, addressing an American, 'requires in its production *great attention in crossing the breed*, otherwise the quality degenerates very quickly. The maintenance of its fineness depends also very much on the nature of the pasturage on which the sheep graze. And we may remark that *your own samples are of a particularly good kind.*'"

Here is a word of encouragement for the Americans, with a word of caution for the Australians. Of the two requisites for the production and preservation of a superior staple, one, suitable pasturage, is bountifully supplied to the Australian grower by Nature, while the other depends upon his own industry and skill. In this, it is to be feared, he has scarcely been just to himself. He has possibly presumed too much upon the natural advantages of the fine sheep-sustaining country in which his capital is staked. It will be well if this note of warning from the land of Stars and Stripes shall rouse him to a more vigilant attention.

[Simmonds's Colonial Magazine.

* Waterton's Cyclopædia of Commerce, p. 672.

† The quantity of wool exported from New South Wales, including the district of Port Philip, in the year 1843, was 17,564,734 lbs.

CHAIRS OF AGRICULTURE.

CHAIRS OF COMMERCE PROPOSED, AND WHY NOT CHAIRS OF AGRICULTURE?

It is stated in De Bow's Commercial Review of the South-West—a work distinguished, it 's hard to say whether most for its originality, industry or ability—that the Mercantile Library Association of Charleston—O. P. Andrews, President—recommend a Chair of Commerce, to be connected with the Association. The Editor, with a judgment and feeling that do him honor, has long evinced his anxiety to have "*commercial education* introduced in all the colleges;" and adds, "It is now understood we are to have a Chair of Commerce in the new University at New-Orleans;" which shows the liberality and good sense of the Legislature. But, let us add, if provision is to be made in the charter of such Institutions for public instruction in the business of Commerce, the *handmaid*, why not also in Agriculture, the mistress? Do not the Plow and its productions lie at the bottom, and form the groundwork for the whole superstructure of industrial pursuits? Is not the earth the great machine, while the manufacturer only fashions its products, and Commerce does the business merely of transporting from place to place, and exchanging these products, in their rude or fashioned state? Of what value is the mill, or the ship, but as they save labor and allow more of it to be applied to the work of production—to the cultivation and employment of the great machine, mother Earth—which gives subsistence and improvement to all? And yet you shall see members of State Legislatures and of Congress, providing for all sorts of instruction, and protecting all sorts of Industry, and showering honors on all sorts of excellence, especially *military excellence*—but what do they do for Agriculture? Might not as much useful information (and by that we mean information that would tend to augment the sources of subsistence, and all the benefits of civilization), be disseminated from a Chair of Agriculture, as from a Chair of Commerce, or of Greek, or of Latin or Hebrew, in any of our Colleges? Yet no one seems to have the thought, or the courage, to demand such a thing, although all these charters are granted—all our educational institutions established—in fact, all the legislation of the country is enacted (speaking in reference to the authority enjoyed by the different classes) by those, in a very large proportion, over all others, who represent, or who are *elected* to represent, the *landed interest*.

Had we the honor of being a Member of an American Congress, or Legislature, on a motion being made to vote a medal, or a sword, or a vote of thanks to an officer for animal courage, or even skill combined with that in the work of manslaughter—for war is but another word for homicide, (sometimes justifiable,) or if it was proposed that any legislative body to which we belonged—representing the majesty and power of the people—should solicit and receive the high honor of being visited by a gentleman armed with sword and buckler, and covered with gorgeous and bloody trophies of war, we would offer an amendment to this effect: "Be it also enacted, that like rewards be bestowed and equal honors offered to whatever man in any State (naming him) should happen to have been, by competent and appropriate authority, pronounced the *most industrious and successful*

and practical farmer—most indomitable and skillful in the *use of the plow*—and if we had the honor to represent a portion of Massachusetts—where more than half a million of taxes are annually self-imposed for the education of every child in the State—we would especially insist that equal public honor should be voted, above all men, to a certain HORACE MANN* for his inestimable, yes, *inestimable* labors, as Secretary of the Board, in the *noble cause of education*—that great, most Christian and effective preventive of crime and of war—and if our reason should be demanded, we would demand in return—pray, gentlemen legislators, what is the end of any legislative action but to promote the public happiness? And we would ask, Can any nation—we will not say Christian—but can *any* nation that consults its true honor and glory and happiness, set a higher value, and bestow larger rewards on skill in human destruction, than on those who stand head and shoulders above their fellow men, in examples of invincible perseverance and skill in augmenting the products of the earth, and with them all the comforts and the means of Christian refinement and civilization—or larger than on those, who render immortal service to their kind by diffusing the seeds of godlike knowledge, and with them, virtue, and power, and peace—that best of all power, which gives men power over themselves, and power to be useful to their fellows?

Perfectly well do we know that in the present depraved state, not so much perhaps of the public sentiment, but of public men's false estimate of it, every motion to keep the Plow always above the sword, and even in advance of the ship and the loom, would be deemed Utopian and idle; and meet with little countenance from men, whose measure for patriotism is too often their measure for popularity. But we trust in God, for the sake of the plow, that better times are coming. We only need the influence of the Press to hasten them—and this is, unfortunately, at present allied to, and in too large a proportion supported by other if not rival industries. What we have a right to hope is, that the agricultural Press at least, will unite with, and go ahead of us in demanding less for war, and more hereafter for agricultural education. Even yet more do we rely on the growing influence of the *schoolmaster!* In the moral progress of the world, honors and patronage we are well aware are first bestowed on warriors. That has been, in fact, the characteristic of barbarism, in all ages and in all parts of the world. Next shoots ahead the trader or exchanger; manufacturers still holding a lower grade, and the cultivators of the soil, whether women or men, are considered mere serfs of the soil, attached to, and sometimes even yet in barbarous portions of Europe, sold along with it, like the trees that grow or the cattle that browse on it. It is only in the highest state of civilization that the producers, working and improving the great machine, rise in the public esteem and begin to learn their true consequence. From that time Agriculture and civilization advance together.

With such a man as HORACE MANN (whom we have not the honor nor the happiness of knowing personally) Secretary of the Board of Education in Massachusetts, in every State of the Union, we should have in process of time Normal institutes in them all. *Every child* in every State, between the age of eight and sixteen, would be ten months at school; 98 per cent. at least of coming generations would make useful and profitable, and worthy citizens; and our poor houses and jails and penitentiaries would be without inmates, and might be converted into schools and colleges. The cost of supporting one regiment would support a Normal school for training agricultural teachers in every State.

* This was in type long before Mr. Mann was nominated for Congress.

Too well we know that the advance of moral truths are slow, but thank God, with the light and power of the Press, we may hope they will be sure. If not, to what end has God endowed us with those faculties, which seem to be lifting us nearer and nearer to Himself? The punishment of death denounced against all who should teach any other philosophy than that of Aristotle, was not revoked until fifty years after that Philosophy was forgotten. It was fifty years after the death of Harvey, when the faculty of medicine in Paris admitted the circulation of the blood. When did the same faculty admit patatoes to be wholesome? One hundred years after it had been proved by experience, and when the decree which forbade the use of them had been revoked.

The Parliament issued a like decree against emetics, and against Brissot, a celebrated physician of the sixteenth century. Contrary to the common practice, he bled, for pleurisy, *in the side where the patient suffered most.* This new practice was denounced to Parliament by the old physicians. Brissot was pronounced infamous, and forbidden to bleed for the future on the side where the pleurisy was. The affair being reported to Charles V, he was going to issue a similar decree, but it happened at the instant that Charles III, Duke of Savoy, died of pleurisy after having been bled in the ancient manner.

The time will come, unless military power should too soon extend its cancerous influences ineradicably throughout the vital parts of our body politic, that a *portion at least* of the *many* millions now given to war, and warlike preparations, will in all countries, and especially in ours, be given to that best of all preventives of war—the *dissemination of knowledge;* and generations to come will look back with shame and blush for that barbarous epoch in the history of their fathers, when *eighty per cent. of all public burdens were imposed in preparations for shedding human blood!* and that, too, by laws enacted by the Representatives of Agriculturists!

A truth, by being new, shocks public opinion; and hence, though at last it may be generally received, it is a long time before it can overcome the prejudices that oppose its early progress. Thus, few public men can be found courageous enough to go for the right, and leave the rest to Heaven.

Well we know, on the point of Congressional power, and pretension to the diffusion of Agricultural knowledge, that they do now exercise the power, and shab off the landed interest with a small appropriation for an annual collection and diffusion of *Patent-Office Reports,* which, we understand, and doubt not, will be a valuable collection of facts; but the craven spirit who is willing to receive this crumb from the public stores as the portion which the landed interest has a right to demand, out of the millions it contributes of the public burdens for the benefit of other classes, deserves to be placed, in the esteem of all well judging friends of Agriculture, on the footing of the starving dog that snaps at a bone, or the senseless kitten that is amused and satisfied at playing with the june-bug that buzzes at the end of a thread, held by a child!

No, no! our country is too distant and too powerful to be in any danger of invasion, and the best preservers of peace are *well-informed minds, in strong, well-fed bodies!* Let the landed interest therefore insist on those who pretend to represent them, drawing no money from their pockets except for the diffusion of useful knowledge, and the improvement of the great machine whose produce gives employment, comfort, life and subsistence to every other industry and employment. Let devotion to these measures be substituted for other mercenary party tests in measuring the merits of public men.

ITEMS FOR COUNTRY READERS,

IN RESPECT OF THE AGRICULTURAL HABITS, PRODUCTS AND RESOURCES OF VARIOUS COUNTRIES WITH WHICH THE UNITED STATES HAVE COMMERCIAL AND DIPLOMATIC RELATIONS; INTERSPERSED WITH REFLECTIONS ON DIVERS MATTERS AND THINGS.

Mr. Editor: Though a practical farmer, I have no ambition to rank among those who insult my profession by insinuating that we who follow it for a livelihood have no business to turn over any leaves but leaves of cabbages or tobacco; nor with any sort of knowledge except the best distance to plant and the right time to sow. In contempt of such disparaging suggestions, I shall send you occasionally, if acceptable, notes of such things as may strike me when, at night and at other times of comparative leisure, a book or my pen may take the place of the hoe and the plow.

As, however, many things do not impress all minds in the same light, it will doubtless happen that some of these items may be esteemed neither useful nor entertaining. You remember the old nursery rhyme—

"Many birds of many kinds,
Many men of many minds."

My aim will be to occupy your pages with such facts and reflections only as may appear calculated to convey useful information, or fitted to gratify that natural curiosity which every gentleman farmer may be allowed to entertain in respect of the productions of foreign countries, particularly as to the articles which form the chief staples of his own.

And first, as to the term "*Gentleman Farmer*," at which it is so easy for every conceited coxcomb of the city, or ill-bred country bird, that would foul his own nest, to turn up his nose with an air of derision. Permit me to say, Mr. Editor, that we agree perfectly in the wish, if not the hope, that the day is coming when, however it may be among other classes, there shall be none other than *gentlemen among farmers!* And by that, what do we mean? Men, whether rich or poor, in velvet or linsey-woolsey, who, looking only to what is appropriate, regard industry as a duty, if only in the way of example; and whether in affluence or in rags, esteem personal honor, and cleanliness, and economy, as among the practical virtues of life; men seeking knowledge above all things, with a nice sense of decorum and self-respect in all situations, however humble, however exalted. In all this, Sir, is there anything incompatible with the condition, or beyond the reach of the real, working, hard-fisted, practical man? Yet, such is the true *gentleman farmer*, who, in moments of leisure turns to his book instead of his bottle, to enjoy in it, the fruit of the greatest of all human inventions—*types*. Thus characterized will be American agriculturists generally, in reasonable process of time, if you can only prevail with the *gentlemen of the Press*, even your own numerous and able colleagues of the agricultural press, to unite with you in perseveringly demanding the same proportionate expenditure for enlightening the husbandry of the country, that is now bestowed on other pursuits.

But to my notes. You may judge whether there be, in what follows, for example about the *Agriculture of Austria*, any more than a gentleman of natural and proper desire for information would be apt to ask of a returning Minister

from that country, Mr. JENIFER, for instance. He would tell you, if his observations agree with the most authentic modern writers and travelers, that the Austrian Empire occupies 258,000 English square miles of the surface of Europe—that is, 45,000 more than France, and 138,000 more than England, Ireland and Scotland. Yet, vast as that Empire is considered in Europe, it is altogether not quite so large as—

	Sq. miles.		Sq. miles.
New-York	36,000	Maryland	11,000
Pennsylvania	47,000	New-Jersey	6,851
Virginia	61,300	Delaware	2,120
Ohio	40,000		
North Carolina	45,000	Total	259,271

While the whole United States, before the annexation of undefined Texas, contained, according to the venerable Darby, two millions and fifty thousand square miles. The surface of the Austrian Empire is said to have the advantage of varied and extensive productive regions, yielding, or capable of growing what in Europe they call *corn*, (meaning what we Yankees call "*small grain*," as compared, we suppose, with the larger grain of *Indian corn*;) also rice, wine, oil, honey, wool, silk, hemp, flax, tobacco, madder, (which we would produce if Agriculturists were half as watchful of their own affairs as manufacturers,) and all the useful vegetables and delicious fruits; also iron, coal, salt, and other minerals and products in abundance; cattle, swine, horses and sheep. The Danube and other great rivers extend inland navigation to almost every part of the Empire. With all these advantages, and a population generally industrious and orderly, Austria is naturally capable of being one of the richest and most powerful States in the world. And yet, what advantage is here quoted that our own country does not possess in an equally eminent degree, with that of a *free Government* thrown into the bargain! But shall we have the wisdom and moderation to turn these advantages to the best account? The greatest blessings—even freedom of speech—of the press—of religion—of government—may become curses if used with licentiousness. Is not this nation already agitated, from year to year, almost exclusively with *struggles for power and patronage*, rather than with thoughts and plans for *higher education and improved Agriculture?* Nay, is not the public ear already alarmed with the rumbling sounds of political earthquakes in the South? as if that glorious region of sun and flowers were destined to be forever the scene of "throes and convulsions" of all sorts! On this subject of education—another word for virtue—we shall see, as we proceed from one country to another, how *we* compare with some of the reviled Governments of Europe, monarchical and despotic. But once more to my notes:

The *population* of Austria, in 1840, was 27,550,401, being throughout the empire 3,171 to the square mile. According to an obviously safe rule of calculation, discovered by that able and veteran statist, W. DARBY, laid down in his Geographical Dictionary, in 13 years our population will rise up to 29,107,304, and so exceed that of Austria at the present time.

"There are some very remarkable phenomena attending the increase of population in the United States. If we take 3,929,327, the amount by the census of 1790, and divide by three, and add the quotient to the dividend, we have the subjoined results:

		By the census.
1800	5,239,802	5,305,925
1810	6,986,402	7,280,314
1820	9,315,902	9,638,131
1830	12,420,269	12,856,407

"This method gives only 503,307 less in five operations than the actual returns of the respective enumerations; and, commencing with the amount for 1800, the final result yields only a deficiency of 296,650. This rule is evidently safe, applied to the whole, as it differs from actual enumerations by giving a less aggregate. Let us, therefore, assume the result, 16,560,359, as deduced, by dividing by 3, commencing with 3,929,327, and carry on the synthesis to 1890,

1850	22,080,478
1860	29,107,304
1870	38,809,739
1880	51,846,319
1890	69,128,425

"The ratio of increase for the whole mass, deduced from 3,929,827 in 1790, and 17,068,666 in 1840, comes out 4.34, and applied to 17,068,666, yields an aggregate of 74,149,986 at the fifth census from 1840. We may therefore, with full confidence, regard the conclusion safe that the intermediate numbers and final results will rather exceed the real enumera-tions."

The military establishment of Austria numbers 464,972. What an enormous burden on the industry of a people! For no matter what the *form* of tax, the *people* must pay for Army and Navy, though sometimes they have the meanness to devolve the whole burden on *their posterity!* And after all, dare we (I ask it not in a party or political sense, but in the name of *American Farmers*, who *have to foot the bills*), dare *we* reproach the Governments of Europe on account of their military establishments? These contiguous despotisms are compelled to keep up their vast armies and navies to defend themselves against each other, and all of them against their own people. But look at the United States! Far removed from all liability to invasion, with old women enough to beat it off with brickbats should it come, mark our servile imitation of those Governments in every form of their preference of the *military* over *civil* service! For the true and practical patriot in quiet civil life, however devoted and pure, small pay for the moment, and, in the way of encouragement and reward, a tenure of office liable to be at any moment dissolved and the incumbent to be whisked down the tide of ruin by the breath of partizans, rising and falling in thick succession—too many of them ignorant, corrupt and revengeful, with greedy followers eager for the promised "plunder," and deaf alike to the claims of patriotism and the appeals of innocence. These things directly concern the *American Farmer*, of whatever *party;* for what is property, what is a country, when its liberties are cloven down? All other classes are here to-day and gone to-morrow, comparatively. The agriculturist is the only man who must *stand his ground* and *rise or fall with his country!*

The Government of Austria sets to our own and others a good example in having frequent and accurate returns made of its population, and general statistics. Without such returns, how can legislators judiciously adjust and regulate the various interests of the State? Every State in this Union should provide, also, for a thorough survey, and periodical reports of its actual products and capabilities.

The total number of the *nobility* in the Austrian Empire has been estimated at 400,000, being one in every ninety inhabitants. What a dead weight here is, again, on the back of *agricultural industry*, when it is considered that these gentry are themselves exempt from taxation. Let American farmers beware how they permit privileged and parasitical classes to grow up, under the forms and shadow of our free Government, to eat into their substance, as the ox-warble (*Œstrus bovis*) eats into the back of the ox. The farmer should look upon every *idle man* with eyes of suspicion, whether he be *on* or *off* his farm; for, he may rely on it, his support *comes, at last, out of the ground!*

As to ELEMENTARY EDUCATION, provided by the Government, in respect of which the most lamentable and disgraceful delinquency is chargeable to most of our States, either in the plan or in the execution of our educational systems, Austria is far from being neglectful of this greatest national concern. In that Empire, below the Embs, according to the authority before me, out of every 100 children above the age of six, 98 are actually at school; above the Embs, 94; Tyrol, 97; Moravia, 94; Bohemia, 93; Styria, 81; Transylvania, 75; Lombardy, 53; Mil-

itary Frontiers, 49; Venice and Corinthia, 33; Dalmatia, 20; Galicia, 13; Sea-coast and Istrica, only 12 out of 100. In 1840, says Darby, between the eleventh and twelfth part of the whole white population of the United States could not either read or write.

And what, demands some caviler, *has all this to do with Agriculture?* Can't a man plow as straight a furrow, and maul as many rails, though he may not be able to read or write? As a mere practical, or *money* question, then, into which some people are for resolving everything, let me quote you, Mr. Editor, a single passage from some judicious and high-spirited "Remarks," attached to a printed Report of the proceedings of the last Annual School Convention of Newcastle County," Delaware—placed in my hands by a self-made and most useful man of that county; one who, from being originally a brick-layer, to his honor be it noted, and *refused credit for a "husk-collar"* but a few years since, has in the mean time made a large, poor farm, now one of the most productive in the county, pay for itself, and exhibit to the whole State a model of intelligent, enterprising and vigorous management. I allude to Maj. John Jones, of "Wheatland," Delaware. I know not by whom these "Remarks" were written, but they do credit alike to the head and heart of the writer, whoever he was. As to the *pecuniary* advantage, then, of only learning to read and write, and the addition it gives to a man's productive capacity, and therefore to his usefulness and value as a member of society, it is stated in these Remarks:

"A few years ago, accurate examination was made in manufacturing establishments, upon railroads and other public works to ascertain whether the laborers and persons employed, who had received a common school education, had any advantage with respect to capacity and conduct in securing better wages, and leading to promotion from lower to higher stations, and increase of compensation. It was found to be the actual result, proved by ledgers and accounts, that laborers and persons having had benefit merely of common schools, possessed great advantages over those who had been destitute of this benefit—surpassing them in many respects, bettering their employment, and improving their condition. It was thus proved, practically, that the prospect of a person with a common school education, for livelihood, for good management, for success, for usefulness and respectability, is far better than that of a person without—more than two to one."

[We regret to be obliged to postpone the residue of our correspondent's remarks, as in them he gives a more practical view of the agricultural products of Austria, comparing them with our own, &c. The preceding has been a long time in type, as might be inferred from some of the facts. *Ed. Farm. Lib.*]

VARIOUS BREEDS OF COWS AND THEIR MILK.

GREEN CORN AND CORN MEAL AS FOOD FOR COWS—QUERY?

In this Journal for last month, page 55, will be found some useful practical observations on the subject of *Milk*—its weight and yield of butter—taken from the Boston Cultivator.

Among other dairy facts well established, and yet not always well considered in the selection of cows, experience proves that the milk of one cow will sometimes give nearly double as much as another; proving that for a *butter dairy*, the greatest milker may be far from being the most profitable cow. The value of the animal depends, therefore, on whether the cow-keeper's object is to sell milk or to sell butter. The milk-sellers in and near London, keep the large

Holderness cow that will, from brewer's grains, secrete immense quantities of thin milk—thin before the usual addition of water to "town milk," for town milk is as different from the *bona fide* milk we get in the country, as a town-bred lady is from one bred and educated in the country. If it be true, as some say, that town ladies are sometimes *painted*—so town milk is sometimes *chalked*—not by the farmer, but by the milk dealers in the city. Nice calculators make a vast difference in favor of selling milk, rather than convert it into butter.

Mr. Newhall, for instance, near Boston, prefers to sell his milk at his barn for three cents per quart, to getting thirty cents per pound for butter: nor is this to be wondered at, if it be true as stated in the article referred to, that it probably takes, on an average, about twelve quarts of milk to make a pound of butter, for, at three cents, the twelve quarts would produce one-sixth more in milk than in butter; but there remains the buttermilk for the table and the piggery, to be set off against the labor and trouble of converting the milk into butter. The richness of the milk and its yield of butter depend no doubt materially on the foodof the cows.

On the other hand, if, as is stated, seven quarts of the *Alderney's milk* will often, if not generally, produce a pound of butter, it would fetch thirty cents in butter against twenty-one cents in milk. We remember some twenty-five years ago to have had one Alderney cow in a herd of others, and the dairy-woman, an honest, observant Irish woman, who has gone since to the West, probably to breed lawyers and judges, and Members of Congress, begged us not, on any account, to sell *that* cow, as *her* milk would "*color* the butter" of all the rest.

It may be mentioned among the curious chronologies of Agriculture, that we sold a very superior heifer calf of that cow, to that noble "old Commodore" and gallant polished gentleman, Commodore Chauncey, for one hundred dollars. He was President of the New-York Agricultural Society at the time—but could never rise higher on the list of winners, according to the jeers of his friend Commodore Porter, than a premium for the "*second best sow!*"

It would be well if others followed the example of Mr. Colt in ascertaining agricultural *facts* with equal precision, of weight and measure.

It may be well here to mention, that in some recent most agreeable intercourse with New-England farmers, two facts were discernable, which it may be useful, on the evidence fo such men, to record: 1. An increasing use of green corn, either drilled or broadcast, as a most valuable resource in *soiling* cattle, and 2dly, An increasing persuasion that a *free* use of *corn meal*, in feeding milch cows has a tendency to exhaust, or materially impair, ultimately, their milking properties. It was said to have that effect on the famous Danvers or Oaks cow, who, by-the-by, be it remarked, *en passant*, never produced an uncommonly good milker. Col. Jaques is our authority, and where could one find a better in a day's ride? It shows that like does not *always* produce like.

Extract of Letter from R. L. COLT. PATERSON, May 22, 1848.

Dear Sir: You ask me for my opinion of the Alderney cows. I have six cows and two heifers that will come into milk in three or four weeks—three yearling heifers and four heifer calves—one bull and one bull-calf of pure breed. I think so well of them that I have just ordered two cows to be purchased for me in the Island of Jersey, of the best and purest breed without reference to price.

I give here the evening and morning milk of my cow Mary, an Alderney of five years; sixteen quarts in the twenty-four hours, weighing thirty-four pounds, equal to two pounds two ounces per one quart: the others were equally good.

My son's Ayrshire cows give milk that weighs 1 lb. 14½ oz. to the quart; and I have a fine native cow which gives milk that weighs 1 lb. 14½ oz. to the quart—and my Devons give milk that weighs 1 lb. 14 oz. to the quart. Ever truly yours, R. L. COLT.

It is said that the modern Alderneys are much improved in shape over what they were years ago. Mr. Stetson of the Astor House lately had one brought into him which *looked* very like a Short-Horn. White, with the Short-Horn head and horn, but with fine yellow skin and perhaps less breadth across the the pins than a thorough Durham, but looking very much one. If a *bona fide* Alderney, they have certainly been much ameliorated in shape since they were brought to this country, and even since Mr. Biddle's importation—now Mr. Colt's. But we always suspect that great changes in some characteristic points are effected at expense of corresponding changes in others.

Can an Alderney lose its ewe, or rather deer-like looking head and neck, and ragged hips, and take on the symmetrical outlines of the Short-Horn, and yet retain that peculiar rich yellow color in its milk? It may be—but *we have not seen the proof of it.*

Certain breeds are good for certrin objects, and had better be let alone. Unfortunately, however when imported and costly, they will degenerate in our countries, because there will never (or very rarely) be enough of them of the same breed but of different families to have recourse to, to maintain their excellence. Mr. George Patterson's herd of Devons is the only exception we know of. It is time the Massachusetts Society was getting another bull from England, or quite as good if not better from Springfield, Maryland, if one is to be had there.

From De Bow's Commercial Review.

UNITED STATES IMPORTS, EXPORTS, TRADE, &c.

From the last able Report of Secretary Walker we make up the following most invaluable Tables:

IMPORTS AND EXPORTS IN 1846 AND 1847, TO JUNE 30.

	Exclusive of Specie.	Specie.	Total.
1846.			
Imports	$117,914,065	$3,777,732	$121,691,797
Foreign Exports	7,865,206	3,481,417	11,346,623
Excess of Imports	$110,048,859	$296,315	$110,345,174
1847.			
Imports	$122,424,349	$24,121,289	$146,545,638
Foreign Exports	6,166,039	1,845,119	8,011,158
Excess of Imports	$116,258,310	$22,276,170	$138,534,480
DOMESTIC EXPORTS.			
1846	$101,718,042	$423,851	$102,141,893
1847	150,574,844	62,620	150,637,464

COMMERCE OF THE UNITED STATES FROM 1790 TO 1828.

	*Imports.**		*Exports.*		
Years.	Total Imports.	Consumption in U. S.	Domestic Produce.	Foreign Mdse.	Total Exports.
1790	$23,000,000	$22,460,844	$19,666,000	$539,156	$20,205,156
1791	29,200,000	28,687,958	18,500,000	512,041	19,012,041
1792	31,500,000	29,745,902	19,000,000	1,753,099	20,735,098
1793	31,100,000	28,990,428	24,000,000	2 109,572	26,109,572
1794	34,600,000	28,073,767	26,500,000	6,526,233	33,026,233
1795	69,756 000	61,266,796	39,500,000	8,489,472	47,989,472
1796	81,436,164	55,136,164	40,764,097	26,300.000	67,064,097
1797	75,379,406	48,379,406	29,850,206	27,000,000	56,850,206
1798	68,551,700	35,551,700	28,527,097	33,000,000	61,527,097
1799	79,069,184	33,546,148	33.142,522	45,523,000	78,665,522
1800	91,252,768	52,121,891	31,840,903	39,130,877	70,971,780

* Exclusive of specie.

Years.	Total Imports.	Consumption in U. S.	Domestic Produce.	Foreign Mdse.	Total Exports
1801	111 363,511	64,720,790	47,473,204	46,642,721	94,115,925
1802	76,333,333	40,558.362	36,708,189	35,774,971	72,483.160
1803	64,666,666	51.072,594	42,205,961	13,594.072	55,800,033
1804	85.000,000	48,768,403	41,467,477	36,231,597	77,699 074
1805	120,600,000	67,420,981	42,387,002	53,179,019	95,566,021
1806	129,410.000	69,126,764	41,253.727	60,283,236	101,536,963
1807	138,500,000	78,856,442	48,699,592	59,643,558	108,343,150
1817	99,250,000	79,891,931	68,313,500	19,358,069	87,671,563
1818	121,750 000	102,323,304	73,854,437	19,426.696	93,281,139
1819	87,125 000	67,959,317	50,976,838	19,165,683	70,142.521
1820	74,450,000	56,441,971	51,683.640	18,008,029	69,691,669
1821	62,585,724	43,696,405	43,671,884	10,824,439	64.974,382
1822	83,241,541	68,395,673	49,874,079	11,476,022	72,160,281
1823	77,579,267	51,310.736	47,155,408	21,170,635	74.699 030
1824	80,543,007	53,846,567	50,649.500	18 322,605	75,986,657
1825	96,340,075	66,395,732	66,844,745	23,793,588	99,535,388
1826	84,974,477	57,652,577	52,449,855	20,440.834	77,595,322
1827	79,484,068	54,901,108	57.878,117	16,431,830	82,334,827
1828	88,509,824	66,975,505	49,976,632	14,044,578	72,264,686

COMMERCE, REVENUE AND POPULATION OF THE U. S. FROM 1790 TO 1847.

Years.	Imports of Specie.	Exports of Specie.*	Net Revenue.	Tonnage.	Population.
1790				478,377	3,921,326
1791			$ 4,399,473 09	502,146	
1792			3,443,070 85	564,457	
1793			4,255,306 56	520,764	
1794			4,801,065 28	628,618	
1795			5,588,461 26	747,965	
1796			6,567,987 94	831,899	
1797			7,549,649 65	876,913	
1798			7,106,061 93	898,328	
1799			6,610,449 31	939,409	
1800			9,080,932 73	972,492	5,318,762
1801			10,750,778 93	947,492	
1802			12,438,235 74	892,184	
1803			10,479,417 61	949,172	
1804			11,098.565 33	1,042,404	
1805			12,936,487 04	1,140,368	
1806			14,667,698 17	1,208,736	
1807			15,845,521 61	1,268,548	
1817			26,283,348 49	1,399,912	
1818			17,176,385 00	1,225,185	
1819			20,283,608 76	1,260,751	
1820			15,005,612 15	1,280,167	9,654,596
1821	$8,064,890	$10,478,059	13,004,447 15	1,298,958	
1822	3,369,846	10,810,180	17,589,761 94	1,324,699	
1823	5,097,896	6,372,987	19,088,438 44	1,336,566	
1824	8,379,835	7,014,552	17,878,325 71	1.389,163	
1825	6.150,765	8,797,055	20,098,718 45	1,423,112	
1826	6,880,966	4,704,533	23,341,231 77	1,534,191	
1827	8,151,130	8,014,880	19,712,283 29	1,620,608	
1828	7,489.741	8,243.47	623,205,523 64	1,741,392	
1829	7,403,612	4,924,020	22,681,965 91	1,260,798	
1830	8,155,864	2.178,773	21,922,391 39	1,191,776	12,866,520
1831	7,305,945	9,014,931	24,224,441 77	1,267,847	
1832	5,907,594	5,656,340	28.465,237 24	1,439.450	
1833	7,070.368	2,611,701	29.032,508 91	1,606,151	
1834	17.911,632	2,076,758	16,214,957 15	1,758,907	
1835	13,131,447	6,477,775	19,391,310 59	1,824,940	
1836	13,400.881	4,324.336	23,409,940 53	1,882,103	
1837	10.516,414	5.976,248	11,169,290 39	1,866,656	
1838	17,747,116	3,508,046	16,158,800 36	1,995.640	
1839	5,595,176	8,776,743	23,137,924 81	2,096,479	
1840	8,882,813	8,417,014	13,499,502 17	2.180,764	17,069,453
1841	4,988,633	10,034,332	14,487,216 74	2,130,744	
1842†	4,087,016	4,813,539	14,260,770 95	2,092,391	
1842‡	7,440,112	506,930	3,927,137 81	2,174,862	
1843§	14,880.223	1,013,861	7,046,843 91	2,158,603	
1844	5,830,429	5,454,214	26.183,570 94	2,280,095	
1845	4,070,242	8,606,494	27,528,112 70	2,417,002	
1846	3,777,732	3,905,268	26,712,667 87	2,562,085	
1847	24,121,289	1,907,739	23,747,864 66	2,839,046	

* Including American Coin. † To September 20th. ‡ To December 31st (3 months.)
§ January 1st to June 30th, (6 months.)

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